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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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SOME FACTORS INFLUENCING MAINE LOBSTER LANDINGS

By Robert L. Dow*

ABSTRACT

In this four-part article, some of the factors influencing lobster landings are examined.

Part I describes experiments carried on to measure the value of extended lobster fishing time. Concurrently information on the validity of catch-per-unit-of-gear as an index of lobster population abundance was obtained. Results indicate that during the last quarter (spring) of the lobster year when the legal-size population has been reduced to a minimum, extended-period fishing may be economically more efficient than short-period trapping. For reasons of extreme variability in the length of the fishing year, catch-per-unit-of-gear cannot be used as a valid index of lobster abundance.

Part II shows that analysis of data on the Maine lobster fishery during recent years indicates a measurable causal relationship between spring sea water temperature and summer landings. The magnitude of summer landings determines the price paid fishermen during the period and influences fishing intensity and landings during the following winter and spring.

Part III points out that available data on the Maine lobster fishery during the period 1939-1947, when landings increased nearly 200 percent above the average of the two preceding decades, indicate that an increase in landed value was the principal causative factor.

Part IV indicates that major long-term fluctuations in Maine lobster landings are the result of variations in fishing effort and that the number of traps fished is the most consistent index of that effort.

Part I - Length of Fishing Time and Catch-Per-Unit-of-Gear in the Maine Lobster Fishery

BACKGROUND

Maine commercial lobster fishermen generally believe that their catches are increased by set-over fishing except during the peak post-moult fishing period of the late summer and early fall when greater catches sometimes compel them to empty their traps daily or, on occasion, even more frequently.

The period of such extension beyond one day may range to a week or more when weather conditions are sufficiently unfavorable, but generally does not exceed 72 hours.

Belief in the efficiency of extended period fishing is based on the assumption that prolonged exposure of lobsters to undisturbed baited traps will increase the net catch. The assumption presupposes concurrent escapement will be less than the continuing level of catch.

Experimental traps fished under the direction of research personnel of the Maine Department of Sea and Shore Fisheries by commercial lobster fishermen in three rather widely

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scattered areas of the central Maine coast provide information on this assumption as well as on the validity of catch-per-unit-of-gear as an index of the magnitude of lobster populations.

In this report the following terms are used: "trap haul," the act of checking a trap for catch by lifting or hauling it aboard the fishing vessel; "daily," on successive days; "set-over," on non-successive days; and "length of fishing time," the duration of time during which a trap is unchecked for catch.



Fig. 1 - A small harbor in eastern Maine showing lobster boats and traps.

MATERIALS

Three groups of 12 to 15 traps were built to the specifications of each of three commercial fishermen who had volunteered to fish them and to maintain catch records during the period of the experiments.

METHODS

A trap built by the Department and one built by the fisherman concerned were fished in pairs for control purposes. This procedure conforms to the practice of fishing two or more traps on a single line in those areas where the type of bottom, tidal currents, water depth, and other related factors are believed to cause high losses when traps are operated singly.

Catch records without regard for legal or non-legal lobsters were maintained on forms prepared and furnished by the Department.

Fishing was carried on during the following months:

Area #1--August, September, October, December, January, March, April, and May.

Area #2--October, November, February, March, April, May, June, October, and November.

Area #3--December, January, February, April, and May.

To reduce individual trap design and location as factors of fishing efficiency, traps were randomly checked for catch and reset on both a daily and set-over basis.

RESULTS

The period of the experiments covered approximately one year; only in July were no traps fished (table 1). Seventy-one days of 807 daily trap hauls averaging 11.4 traps per haul-day produced 2,005 lobsters, or an average of 2.55 lobsters per trap haul. A total of 198 days of 2,505 set-over trap hauls averaging 12.6 traps per haul-day produced 6,323 lobsters, or an average of 2.52 lobsters per trap haul.

Table 1 - Comparison of Maine Lobster Catches by Daily and Set-Over Trap Hauls

Month	Total Daily Trap Hauls	Avg. No. Lobsters Caught Per Trap	Total Set-Over Trap Hauls	Avg. No. Lobsters Caught Per Trap
August	104	3.16	110	3.03
September	85	3.58	397	2.95
October	52	2.35	244	2.78
November	76	2.96	198	3.55
December	240	2.42	260	2.28
January	-	-	172	1.90
February	54	3.56	174	2.48
March	16	1.75	180	2.34
April	72	1.51	274	1.79
May	108	1.53	416	2.32
June	-	-	-	-
Total	807	-	2,505	-
Avg. no. of lobsters caught per trap	-	2.55	-	2.52
Avg. no. of traps hauled per day	11.4	-	12.6	-

DISCUSSION

LENGTH OF FISHING TIME: Set-over haul fishing was carried on in all months except July. Daily haul fishing was carried on in all months except January, June, and July. Since the same traps were used for both types of fishing, individual trap bias was not a problem.

Set-over haul catches were greater in October, November, March, April, and May; while daily haul catches were greater in August, September, December, and February.

There is evidence to support the belief of commercial fishermen that during the peak post-moult (September) availability of lobsters, daily haul catches are somewhat higher (3.58 per trap) than those made by set-over (2.95 per trap) fishing. The high average trap catch at this season, with consequent crowding of the lobsters in the trap, competition for entry, more rapid deterioration of bait because of high water temperature, and subsequent escapement during the set-over time may serve to reduce the set-over catch in comparison with daily haul fishing.

Conversely, less crowded conditions toward the end of the lobster year (June) when the available legal population has been reduced by eight months of fishing may make set-over fishing economically more attractive. Re-



Fig. 2 - Maine fisherman repairing lobster trap.

salts of the experiments indicate that during the last third of the lobster year (March-June) the average catch for set-over fishing is 35 percent higher than for daily fishing.

The most intense fishing activity occurs during the period from July through September. When late moulting delays the appearance of the annual recruitment significantly into this period, most of the fishing effort has not been effectual in reducing the recruited population, and a larger population survives to the winter and spring fisheries. The reduced intensity of fishing--set-over fishing--may permit a greater carry-over abundance to last through the winter and spring fisheries. The net affect on annual landings is likely to be small because the fishing effort expended prior to the delayed summer recruitment actively diminished annual landings by the yield of an equivalent effort applied at the end of the lobster year--May and June--when its productivity would be least.



Fig. 3 - Cared boats have been largely replaced in the Maine fishery by outboard and inboard powered boats.



Fig. 4 - Typical Maine lobster boats.

CATCH-PER-UNIT-OF-GEAR: Although average catch per trap per day was slightly lower (0.03) for set-over fishing than it was for daily fishing, total catch for the year was 2.8 times greater because of the greater number of fishing days. In these experiments typical of fishing practices and conditions, the set-over fishing year contained 198 haul days during which each trap produced an average of 500 lobsters. The daily haul fishing year, less attractive economically toward the end of the lobster year because of the sharply reduced available population of lobsters, contained only 71 haul days during which each trap produced an average of 181 lobsters.

Since annual catch-per-unit-of-gear is based on the total annual catch per trap, the more days of fishing the greater will be the total catch and the yield per unit of gear.

For reasons of demonstrated wide variability in the length of the actual fishing year of any given number of traps, catch-per-unit-of-gear in the lobster fishery has no validity as an index of abundance. It does serve as an imprecise measure of response on the part of fishermen to meteorological and economic pressures.

CONCLUSIONS

1. On an annual basis, set-over fishing is not more efficient nor will it produce greater landings than daily haul fishing. There is evidence that as the available population declines toward the end of the lobster year, set-over fishing may become economically more efficient.
2. Catch-per-unit-of-gear is not a valid index of lobster abundance.

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**Part II - Influence of Economic and Biological Factors in the
Maine Lobster Fishery as Measured by the Sequential Relationship
of Sea Water Temperature to Landings to Price to Fishing Intensity**

Two divergent explanations to account for the magnitude of fluctuations in Maine lobster, *Homarus americanus*, landings have been discussed in previous reports. Dow and Trott (1956) attributed fluctuations in annual landings to economic influences while Taylor, Bigelow and Graham (1957) associated a correlation of 0.85 between lobster landings and corresponding mean sea water surface temperature for the months October through April during the period 1939-1949 with the probability of more optimum conditions contributing to the survival of a greater number of lobsters to catchable size.

That both biological (meteorological) and economic factors influence lobster landings has been suggested by these studies. How these factors are related and the extent to which each effects landings is indicated by a study of the fishery in recent years.

(1) Measurable relationships between April-May subsurface sea water temperature (thermograph records, 1952-1960) and July-August post-moult lobster landings representing one-third of the average annual catch, (2) between July-August landings and average landed price, and (3) between average July-August price and landings during the first six months of the following year representing one-sixth of the average annual catch, are suggested for the period 1952-1960 by correlations^{1/} of 0.96 between the first two series attributable to the association between water temperature and recruitment of previously sub-legal lobsters through expansion or contraction of the moulting period, -0.98 between the second two series attributable to market response, and of 0.72 between the third two series attributable to fishing intensity.



Fig. 5 - Ocean perch racks (what is left of fish after filleting) are used extensively in Maine for lobster bait.

Table 2 - Relation of April-May Water Temperature to July-August Maine Lobster Landings to Landed Price to Winter-Spring Landings

Year	a	b	c	d
	April-May Water Temperature Above 40° F.	July-Aug. Post-Moult Lobster Landings	July-Aug. Avg. Landed Price	Lobster Landings the Following January-June
	° F.	Million Lbs.	¢1 Lb.	Millions Lbs.
1960	6.6	6.5	44	4.3
1959	4.8	5.3	51	4.5
1958	5.8	6.0	50	4.4
1957	8.0	7.8	35	4.4
1956	5.0	5.1	50	4.1
1955	8.6	3.3	32	3.2
1954	8.5	8.1	34	3.8
1953	10.0	8.1	33	3.6
1952	7.6	7.1	42	4.1

Relationship between a and b with a correlation of 0.96 may be expressed as $b = 2.1 + (0.67)a$.

Relationship between b and c with an inverse correlation of -0.98 may be expressed as $c = 13.1 + (-1.5)b$.

Relationship between c and d with a correlation of 0.72 may be expressed as $d = 2.42 + (0.385)c$.

Relationship between a and d with an inverse correlation of -0.69 may be expressed as $d = 52.2 + (-0.167)a$.

^{1/}Correlations were calculated by the simple linear method of least squares.

Water temperature is related to the peak time of moulting. After moulting, feeding activity increases and lobsters are more easily trapped. The level of water temperature in April and May is related to the magnitude of the catch in July and August. Catch determines the price paid fishermen during July and August. Summer price appears to influence fishing intensity of the following winter and spring and, in turn, is related to the magnitude of landings for the period.

Based on water temperature only, computed values differed from actual values by ± 4.2 percent for July-August landings, by ± 6.0 percent for July-August price, and by ± 8.3 percent for January-June landings during the period.

Although winter-spring inshore water temperature, closely related to the time of recruitment of newly moulted lobsters, had no measurable effect upon landings of contemporaneous winter and spring fisheries, July-August price factors, determined by post-moult landings, appear to have directly influenced fishing intensity throughout the subsequent January-June period (table 2).

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Part III - Observations on the Productive Recovery of the Maine Lobster Fishery

BACKGROUND

Prior to 1939 when a continuous statistical service was established, Maine lobster catch records were based on estimates of the industry, the Department of Sea and Shore Fisheries, and the U. S. Fish and Wildlife Service (or its predecessor agencies).

These data, extant only since 1880, indicate that landings reached a peak of 24.5 million pounds in 1889 but declined to an annual average of 13.5 million for the next 15 years.

In the following decade a gradual increase reached 20.0 million pounds by 1910 but declined thereafter to 10.5 million pounds annually at the beginning of World War I. From 1919 to 1940 production fluctuated only moderately, between 5.0 and 7.75 million, the lowest average in the history of the fishery.

A rapid increase in landings occurred during World War II and by 1945 total landings exceeded 19 million pounds. Despite annual declines since 1945, a general upward trend has characterized the fishery and during the 1950 decade landings averaged 21.5 million pounds annually.



Fig. 6 - Lobster dealer's buying site in eastern Maine.

Production data together with other information suggest that historically as well as otherwise the fishery may be divided into several rather distinct periods (table 3). Until about 1845 little commercial use had been made of the resource. Other than a small seasonal market for live lobsters, the shellfish were used only as bait in some of the groundfish fisheries, for fertilizer on coastal farms, and as food.

The development of satisfactory canning methods led to the rapid expansion of the fishery beginning with 1843. For the next 50 years, until an increase in the legal minimum length of lobsters was established in 1895, the principal commercial fishery was for the purpose of supplying canneries.

The expanding live lobster market which had been the primary reason for a "market" minimum size to replace the "canning" lobster

Period	Years	Millions of Pounds
Canning	1843-1894	20.1
First large-scale live storage	1895-1904	13.3
Pre-World War I	1905-1916	15.2
Post-World War I	1919-1929	6.5
Depression	1930-1938	6.5
World War II	1939-1947	12.6
Post-World War II	1948-1960	21.1

resulted in the construction during the following decade of 23 natural sea water enclosures called "pounds." This was the largest number of such storage facilities ever constructed in Maine in so short a time. (Dow, Harriman & Scattergood 1959.) These 23 pounds provided storage capacity for 3.2 million pounds of lobsters as compared with 44 operational pounds in 1958 with a capacity of nearly 4.5 million pounds. Since 1895 the live market has been the principal outlet for lobsters.

Production data suggest the probability of cyclic changes in the abundance of lobsters, a concept which is not supported by biological and economic information developed since 1939.

DISCUSSION

In terms of change, the period of greatest interest is that of World War II when the fishery recovered from two decades of extremely low production. Following World War II annual landings reached the highest catch level

in the history of the fishery. There is no evidence to indicate that the higher production of the post-World War II period is anything more than a modification of the factor or factors which made possible the rapid changes of the World War II period.

Average and maximum catch of the post-World War I and depression periods are represented by 1939 and 1940 landings. By 1945 landings had increased 189 percent.

The principal factors likely to have any considerable influence on lobster landings are abundance, sea water temperature, type of bait, number of traps, number of fishermen, and average landed value.

Since standard methods of sampling lobster populations for abundance have produced such imprecise results, fluctuations in abundance can only be inferred. Indications of relative abundance, other than landings, do not suggest any significant change during the period. The average weight of lobsters in the catch remained unchanged after the minimum legal size increase in 1942. During each of the three years preceding the increase in minimum size, average weight had been 1.1 pounds. During each of the six years following the increase, average weight was 1.2 pounds. Any significant change in average weight would have been indicative of an inverse increase or decrease in abundance.



Fig. 7 - A Maine fisherman sells his catch of lobsters.

Catch-per-unit-of-gear, frequently used as an index of relative abundance, has subsequently been shown to be an invalid measure in the lobster fishery because of variations in fishing effort. (R. L. Dow 1961.) In 1940 at the beginning of the period and in 1947 at the end of the period, catch-per-unit-of-gear in the Maine lobster fishery was the same, 35.4 lobsters per-trap-per-year.

Surface and sub-surface sea water temperatures have been shown to be measurably related to certain seasonal lobster landings but there is no evidence of any relation to annual catch. (Taylor, Bigelow and Graham 1957, and R. L. Dow 1961.)

The development of the ocean perch fishery provided a source of bait which later experiments by the Department of Sea and Shore Fisheries demonstrated to be approximately 25 per cent more efficient than other natural baits then in use. Waste from the processing of ocean perch fillets first became available in quantity in 1939. During the next several years landings of this species increased to 40 million pounds. Both the number of fishermen and the number of traps being fished increased greatly during the period as did average landed value.

Coefficients of correlation between each of the several factors and annual lobster landings are of the order of 0.8 to 0.99 (table 4). Although deviations from the year-to-year trend occurred in all series, only that of landed value was limited to one year, 1942, the year in which an increase in the legal size reduced the catch a minimum of 0.7 million pounds, an amount calculated from the size-frequency distribution of lobsters in the catch during the preceding three years. Had these lobsters been available to the fishery, total landings for the year would have been 9.1 million pounds or more.

Year	Total Annual Lobster Landings Million Lbs.	Mean Surface Temperature °F.	Ocean Perch Landings Millions Lbs.	No. Lobster Traps 1,000 Units	No. Fishermen 1,000	Average Ex-Vessel Price ¢/Lb.
1947	18.3	48.5	40.0	516	5.3	37.3
1946	18.8	47.2	41.1	473	6.6	38.3
1945	19.1	47.0	27.8	378	6.2	40.1
1944	14.1	46.5	24.3	252	4.9	28.8
1943	11.5	45.3	25.8	209	4.2	25.6
1942	1/ 8.4	46.6	26.4	187	3.5	21.7
1941	8.9	46.0	20.7	194	3.6	17.7
1940	7.6	44.6	7.9	222	3.7	16.6
1939	6.6	43.4	5.4	260	3.7	15.6
Coefficient of Correlation: $r =$		0.80	0.83	0.85	0.95	0.99

^{1/}An increase in the minimum legal size in 1942 reduced landings a calculated minimum of 0.7 million pounds.

Moult-classes consisting of 15 percent carapace increment groups were calculated for all lobster landings from July 1939 through June 1952 based on length-frequency and length-weight measurements and moult-frequency observations.

It was observed that lobster-year (July-June) catches varied independently of moult-class catches. When the magnitude of the catch from the first year fishing of newly recruited lobsters suggested a decline in the relative abundance of the previously sub-legal population, subsequent proportionally higher lobster-year catches from this same group as it moved through the legal size range indicated that fluctuations in apparent abundance were not sufficient to influence landings significantly.

Lobster Moult Class	Average Ex-Vessel Price ¢/Lb.	Moult-Class Landings Million Lbs.
1939-1940	15.7	7.0
1940-1941	17.2	8.0
1941-1942	19.7	9.8
1942-1943	25.7	11.3
1943-1944	29.5	13.4
1944-1945	34.6	16.6
1945-1946	40.4	18.4
1946-1947	37.5	17.1
1947-1948	37.2	17.2
1948-1949	39.5	17.9
Coefficient of Correlation: $r =$	0.99	

The average value of moult-class lobsters landed during the 13 lobster and 14 calendar years of the period was determined. Data on moult-class landings and values are listed in table 5.

Data in tables 4 and 5 have been purposely limited to the period 1939 until after World War II because of the behavior of the lobster fishery. Lobster landings in Maine from 1919

to 1940 averaged only 6.6 million pounds per year but rapidly increased through 1945, then declined temporarily for the next three years. My interest has been in trying to account for this phenomenal change. Landings by calendar years, lobster years, and by moult-class years indicate that economic factors were the most important in influencing the recovery of the lobster fishery. Since that time, other factors, including the number of fishermen, the number of traps, water temperatures, the extent of the area fished, and the length of fishing time, appear to have increased considerably in importance. There is some indication that since World War II there has been an inverse correlation between economic factors and landings. That is, fishing effort declines when price declines which in turn leads to increased price with lack of supply. This, in turn, stimulates increased fishing effort and landings go up. For example, in 1948 average ex-vessel price per pound was 40 cents a pound because landings were down to 16 million pounds that year. In 1949 landings increased to 19 million pounds but price declined to 35 cents a pound. Price remained at the same level in 1950 and landings declined to 18 million pounds. In 1952 price went up to 42.5 cents a pound and landings in 1953 increased to 22 million pounds.

SUMMARY

Indications of relative abundance (landings, average weight, and catch-per-unit-of-gear) fail to support the concept of any significant increase in abundance during the World War II period. Water temperatures are related to the concentration and magnitude of seasonal landings rather than to the magnitude of annual landings.

The more efficient bait, ocean perch, is still not available in many remote fishing areas where landings have shown the same rate of increase. The number of traps is a biological function insofar as traps are agents of food and shelter. Traps also reflect long-term fishing effort and in that respect are of economic significance.

Moult-class catches derived from biological data support the reliability of the high correlation between average landed ex-vessel price and annual landings during the World War II period 1939-1947.

CONCLUSION

The magnitude of productive recovery of the Maine lobster fishery from the post-World War I and Depression periods is attributable to economic factors of which landed value during the World War II period is the most reliable indicator.

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Part IV - The Role of Traps in the Maine Lobster Fishery

BACKGROUND

With respect to the fisherman, the role of traps in the Maine lobster fishery is relatively uncomplicated, limited to the catching of lobsters. In terms of biology and economics, the function of traps may become somewhat more complex.

An unbaited trap is an agent of shelter, while a baited trap also provides a readily available source of food. The number of traps in operation is indicative of the level of fishing effort.



Fig. 8 - A portion of harbor at Cape Porpoise showing lobster "car" (left foreground), boats, and traps stacked on the dock.

Traps are of particular interest in the Maine lobster fishery because records of their number are more consistent and include a longer period of years than those of any other factor likely to influence the magnitude of landings. Trap records are available for 40 of the 63 years since 1897.

Year	Traps	Landings
	No. in 1,000's	Millions of Lbs.
1960 ¹	745	24.0
1959	717	22.3
1958	609	21.3
1957	565	24.4
1956	533	20.6
1955	532	22.7
1954	488	21.7
1953	440	22.3
1952	417	20.0
1951	383	20.8
1950	430	18.4
1949	462	19.3
1948	459	15.9
1947	516	18.3
1946	473	18.8
1945	378	19.1
1944	252	14.1
1943	209	11.5
1942	187	8.4
1941	194	8.9
1940	222	7.6
1939	260	6.6
1938	258	7.7
1937	186	7.3
1935	185	7.7
1933	180	5.9
1932	208	6.1
1931	168	5.4
1930	205	7.8
1928	211	7.1
1924	154	5.5
1906	305	15.0
1905	254	11.1
1903	268	13.1
1902	298	14.3
1901	304	14.0
1900	327	14.4
1899	335	12.7
1898	279	12.3
1897	234	11.2

Coefficient of Correlation: $r = 0.907$.

¹/Preliminary estimate.

DISCUSSION

Within this historic period (table 6), lobster landings have ranged from 5 million to 24 million pounds and the number of traps from 150,000 to nearly 750,000.

Chronologically as well as in terms of the number of traps fished, the fishery falls into three major periods (table 7). From 1897

Period	Annual Average of Traps Fished	Average Annual Landings	Years in Period
	No. in 1,000's	Millions of Lbs.	No.
1945-1960 . .	509	20.6	16
1924-1944 . .	205	7.8	15
1897-1906 . .	289	13.1	9

to 1906 the number of traps fluctuated between 234,000 and 325,000 and landings between 11.1 million and 15.0 million pounds. Data are unavailable again until 1924. From 1924 to 1944 the number of traps ranged from 154,000 to 260,000 and landings from 5.4 million to 14.1 million pounds. During recent years, 1945 to 1960, traps have ranged from 378,000 to 745,000 and landings from 15.9 million to 24.4 million pounds.

The relation of the number of traps fished to various levels of landings is fur-

ther illustrated when landings are grouped by four-million-pound annual units (table 8).

The number of traps being fished appears to be determined by the average landed price paid fishermen for their catch. Only since 1939 have consecutive annual data on average landed price been available. Coefficients of correlation for the series; price and current year following; and price and average number of traps of current and year following-range from 0.88 to 0.93.

Table 8 - Relationship Between Number of Traps Fished and Various Levels of Annual Landings

Range of Annual Landings Millions of Lbs.	Annual Average No. of Traps No. in 1,000's	No. of Years Considered
5-8	203	13
9-12	262	5
13-16	316	7
17-20	449	8
21-24	585	7

CONCLUSION

Major long-term fluctuations in Maine lobster landings can be attributed to variations in fishing effort of which the number of traps being fished is the most consistent index.

UNITED STATES CATCH BY AREAS, 1960

(Figures represent million pounds)



DEVELOPMENT OF A THREAD-HERRING FISHERY IN THE GULF OF MEXICO

By Johnny A. Butler*

ABSTRACT

Growth of industrial fisheries in the Gulf of Mexico has stimulated a search for supplemental sources of fish for industrial uses. One potential source has been found in the thread-herring stocks of the Gulf. The thread-herring resource is described and efforts of the U. S. Bureau of Commercial Fisheries and the industry to develop methods of fishing for thread herring with lampara and purse seines are reported.

INTRODUCTION

The rapid growth of the industrial fishery of the Gulf of Mexico--due primarily to the growth of the fish-reduction and petfood industries--has resulted in an increasing demand for industrial fish. This demand has created a need for further exploration and evaluation of fishery resources that might be made available for continued industrial expansion and development.

Growth of the fish-reduction industry in the Gulf since 1939 is shown in the landing statistics for menhaden (fig. 1). This growth has been brought about through increased and improved plant facilities, and in recent years, through improved fishing techniques and vessel modernization. Aerial spotting, larger and better-equipped vessels, use of lighter synthetic seines, power blocks, and refrigeration have greatly increased the production capabilities. But production has remained limited to a few months in any one locality and has been subject to serious fluctuations.

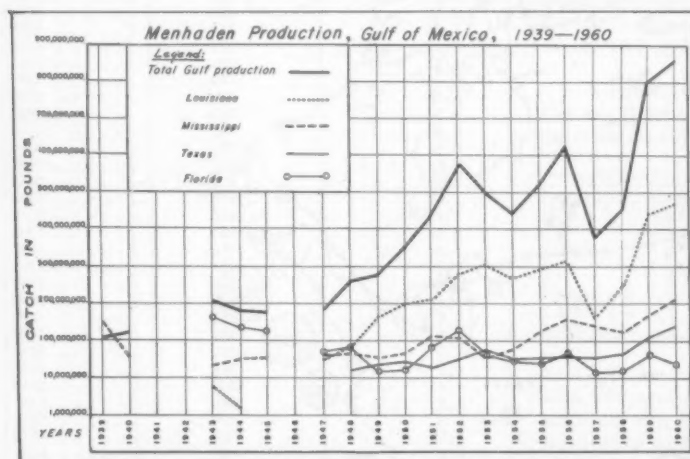


Fig. 1 - The Gulf menhaden industry has shown a relatively constant growth since 1939, but sharp year-to-year and area-to-area fluctuations in production have often created serious problems in maximum utilization of equipment and vessels. Supplementary sources of fish are needed, not only to allow continued increases in production, but also to reduce the fluctuations in production. Missing portions of the graph represent periods for which information is not available.

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Since 1952, several petfood plants have been established along the northern coast of the Gulf of Mexico. These plants process and can catfood from raw material produced primarily by bottom-fish trawlers (Haskell 1961). Approximately 75 percent of the trawl catches, which in 1960 amounted to over 80 million pounds worth \$1.2 million ex-vessel, is made up of croakers, spots, and white trout, with the balance consisting of several dozen miscellaneous species.

Future expansion of the industrial fishery will depend ultimately on the availability and utilization of new resources in new areas, with new or modified equipment and methods. The thread-herring resource appears to offer one promising

avenue for such future expansion. The potential value of this resource to the industrial fishery is indicated by thread-herring catches made recently off the Southeastern States in coastal waters of the Atlantic (table 1) as a supplemental source of fish for the fish-reduction and petfood fisheries. Similar indications

Table 1 - Thread Herring Landings,
South Atlantic Coast of U. S.,
1956-59 1/

Year	1,000's of Pounds
1959	4,372
1958	109
1957	12,057
1956	5,000

1/ Figures prior to 1956 are combined with menhaden landings.

they are present in many coastal waters during periods when menhaden are scarce.

THREAD HERRING

The thread herring, *Opisthonema oglinum*, is a sardine-like fish that ranges from the Gulf of Maine to Rio de Janeiro and is found in great abundance from North Carolina to the West Indies. Between Cape San Blas and Key West, Fla., the thread herring is the predominant species of surface-school fish and a year-round inhabitant, and in all other portions of the Gulf it may be found for at least some portion of the year. The full extent of the population of thread herring in the Gulf is unknown, owing to the absence of either an established commercial fishery or extensive research, but based on observations of schools throughout the Gulf for several years the resource is estimated to be capable of supplying a sizable annual catch.

In general appearance, the thread herring resembles menhaden, scaled sardines (razor bellies), and gizzard shad. The best diagnostic characteristic of the thread herring is the unusually long last ray of the dorsal fin. This characteristic is sufficient to differentiate the fish from menhaden and scaled sardines, and gives rise to the common name of "hairy back," frequently used by commercial fishermen. The gizzard shad, found in both fresh and salt water, has a similar long last ray on its dorsal fin. But the thread herring has scales that cross over the ridge of the back, anterior to the origin of the dorsal fin, whereas the gizzard shad is naked of scales along this ridge. Also, the pectoral fin of the thread herring folds into a groove not found in the gizzard shad.

Several behavior characteristics of thread herring make these fish difficult to catch with standard commercial gear. The schooling behavior is such that at times large schools rapidly divide into smaller groups, and these smaller groups, of 25 tons or less, are extremely maneuverable, fast, and very difficult to encircle. Commercial menhaden seiners prefer to work larger and less maneuverable schools owing to the amount of labor involved in setting their large seines. Thread-herring schools have also been observed to disperse completely in a matter of a few seconds apparently when the fish are highly excited. Adding further to the difficulty, when thread herring are entrapped by a net they tend to charge the webbing and there is a high incidence of "gilling." Finally, thread-herring schools often occur in very shallow water where the deep webbing of ordinary menhaden seines is endangered by contact with the bottom and where the efficiency of these seines is lessened.

For these reasons, as well as the lack of sufficient information on the abundance of fish present, commercial use of the thread-herring resource has been limited, and capture has been incidental to capture of other species.

EFFORTS TO FISH FOR THREAD HERRING IN THE GULF OF MEXICO

In June 1953, the U. S. Bureau of Commercial Fisheries vessel Oregon was engaged in exploring for bait resources for use in live-bait tuna-fishing studies. Numerous schools of thread herring were observed in the eastern Gulf during these explorations (Siebenaler 1953) and their presence recorded. Repeated observations of large and numerous schools have been made since by Bureau vessels--in the eastern Gulf in all seasons, and in other Gulf areas through most of the year. Reports of the presence of these large and numerous schools, combined with motion-picture records made for reference and shown to members of the industry, has created considerable interest in the resource.

INDUSTRY LAMPARA-SEINE OPERATIONS--1957-58: Commercial lampara fishing in the Gulf actually began in 1957. In St. Petersburg, Fla., a 35-foot mackerel boat (fig. 2) was equipped with a mechanically-powered gurdy and a West Coast lampara sardine seine to fish for Spanish sardines (*Sardinella anchovia*). These fish were sold as bait for sport fishing. Some schools of thread herring were present in the same areas as the Spanish sardines and small quantities were caught, although little specific effort was given to catching this species because their acceptability as bait was less than that of the Spanish sardines and they are generally more difficult to catch.



Fig. 2 - The Florida lampara-seine operation for sardines. The two wings of the lampara are being brought aboard with the aid of a two-roller gurdy.

The use of lampara seines for thread-herring capture, although shown to be generally efficient, presented several problems: In shoal waters where thread herring are generally found in greatest abundance, the leadline of the conventional lampara seine reaches the bottom before assuming its closed-bottom shape; use of a powered gurdy for retrieving the lampara causes the leadline to lift, creating an avenue of escape for the fish as the seine is hauled through the fairlead at the rail; and tidal conditions sometimes affect the proper opening of the lampara bunt, and make it necessary for the vessel to be positioned downwind from the seine on completion of the set.

BUREAU GEAR TRIALS--1958-59: In the late fall of 1958, in view of industry interest in fishing new industrial fish sources, the Bureau's gear research vessel George M. Bowers was equipped with a hydraulically-powered, two-roller, lampara-seine gurdy (fig. 3) and three types of lampara seines were tried in efforts to correct some of the deficiencies noted in the gear used for thread herring off St. Petersburg. Nets used were: A South African purse-lampara; a tuna-bait lampara; and a "simplified design" lampara. Of the three, the "simplified design" lampara was the most effective for catching thread herring. The "simplified design" lampara is 213 fathoms long with a bunt 33 fathoms long and two wings each 90 fathoms. The bunt is made of $\frac{1}{2}$ - and $\frac{3}{4}$ -inch stretched-mesh

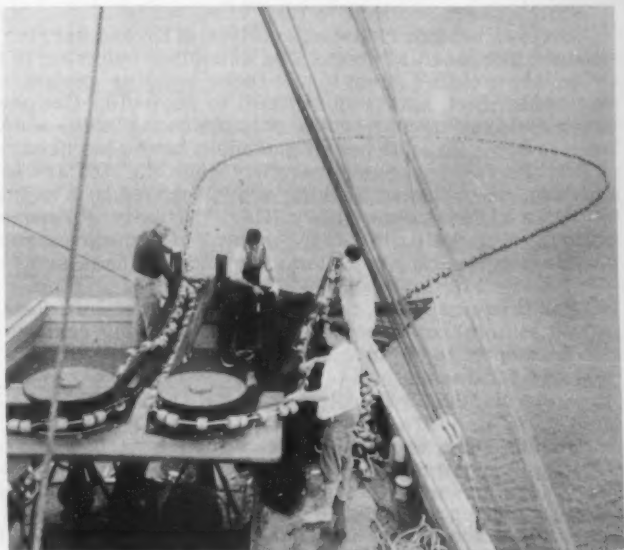


Fig. 3 - Retrieving the lampara seine aboard the George M. Bowers.

webbing and the wings are 4-inch stretched-mesh webbing. The $\frac{3}{8}$ -inch synthetic corkline is buoyed up with 3- by 4-inch cylindrical plastic floats on the center section and 2- by 3-inch tapered plastic floats on the wing sections. A $\frac{1}{2}$ -inch galvanized chain is used for the lead-line. The bunt (fig. 4) is hung full, three feet to one, for maximum "pocket" and the wings are

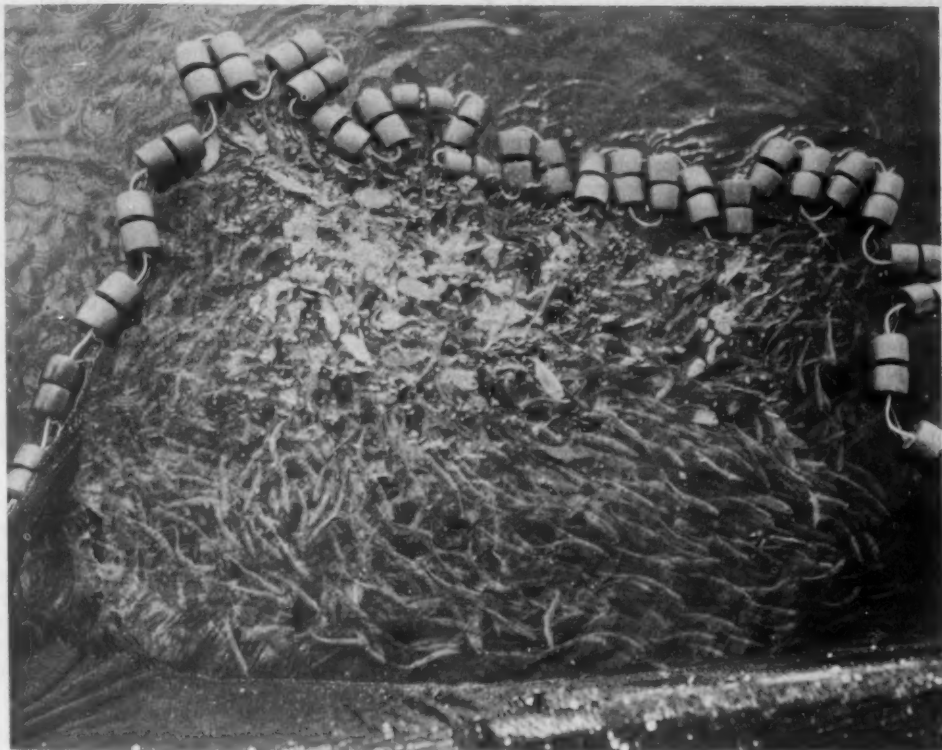


Fig. 4 - Thread herring hardened in the bunt alongside the George M. Bowers.

hung almost straight (6:7) to assure closing of the 4-inch meshes when the net is pulled with the power gurdy.

Development of the "simplified design" lampara helped alleviate some of the problems that faced the Gulf lampara operator--it partially eliminated the opening up of a hole through which the fish could escape when the net was retrieved and it provided a lampara which could be used in shallow water. More important, however, the Bureau's preliminary gear trials, combined with the moderate success of the commercial lampara operation for sardines, encouraged members of the fish-reduction industry of the north Gulf to conduct trials of their own with lampara seines and other gear for thread herring.

INDUSTRY TRIALS WITH LAMPARA SEINES--1958-59: In 1958, a member of the menhaden industry in Pascagoula, Miss., equipped a shrimp vessel with a mechanically-powered gurdy and a 350-fathom lampara seine. The seine was built by a successful West Coast lampara fisherman along the design of lampara seines used on the West Coast for mackerel and sardines. Before seining for menhaden, a crew of Gulf Coast fishermen was sent to San Pedro, Calif., for training aboard lampara vessels in that area. The first experimental lampara seining for menhaden by this unit began during the latter part of the 1958 menhaden season (October-November) off the coasts of Mississippi and Louisiana. As was to be expected

in using gear designed specifically for one fishery in a different fishery, need for modification of design soon became apparent. Minor changes in mesh size, hangings of the corkline and leadline, and size and weight of the leadline were tried without initial success.

Later in the winter of 1958/59 the lampara vessel was moved to the St. Petersburg area where thread-herring schools were available for continuation of this experimental fishing. The thread herring were smaller than the menhaden and additional changes in mesh size were necessitated. Following these changes results were encouraging. Catches ranged as high as 27 tons of thread herring per set. The catches from this experimental operation were transported to Pascagoula and used with trawl-caught fish in canned catfood.

These results created more interest among the menhaden and petfood plant operators in the new source of fishing stocks and the different fishing techniques. Numerous representatives of the menhaden industry observed this new technique, and perhaps of greater importance, saw the abundant schools of thread herring from Clearwater to Boca Grande, Fla.

INDUSTRY TRIALS WITH PURSE SEINES--1958-60: The first-hand observations of the thread-herring resource, made as a result of Bureau efforts, stimulated another vessel operator to attempt fishing thread herring with the standard two-boat purse-seine technique used in the Gulf menhaden fishery. Preliminary efforts were made during the offseason period for menhaden, a period which, in the Gulf, normally occurs between November and April. Lack of knowledge of bottom conditions in the area chosen for trials, use of purse seines designed for deeper water, and the presence of excessive numbers of spiny clams (*Atrina* sp.) caused considerable damage to the purse seines. In spite of these problems, sufficient quantities of thread herring were caught with menhaden seines to encourage resumption of fishing in the same area the following winter season with a different type of purse seine.

Single boat purse seining was introduced in efforts to catch thread herring during the winter of 1959/60. The single-boat technique (Knake 1950) utilizes a single small seineskiff and a larger vessel which carries the seine. When a school is sighted by aerial spotting or spotting from the masthead of the main vessel, the skiff is cast off with one end of the seine made fast to it. The main boat then encircles the school, laying the seine out over its stern. On completion of the circle, the end of the seine is passed back to the main vessel from the skiff and the bunt of the seine, which is at one end, is tied off alongside the vessel on the forward port rail. The seine is then pursed using a ton weight of about 600 pounds, after which the purse rings are brought aboard and the wing is retrieved through a power block hung from the boom. As the wing comes aboard it is restacked on the stern for resetting. The fish are hardened in the bunt by strapping, and are either pumped or brailled into the fishhold. The single-boat purse-seine technique has proven to be the most successful technique used so far for catching thread herring in the eastern Gulf. Rapid pursing, rapid retrieving of the wing, applicability to use with small schools, and the low manpower requirements of this technique make it generally acceptable.

Three small vessels, the largest a 53-foot shrimp vessel, were equipped with this type of gear during the winter season of 1959/60 in the St. Petersburg area. Catches ranged from 5 to 40 tons per set. Adverse weather conditions and nonavailability of freight vessels to transport the catches to a petfood cannery in Pascagoula and a fish-reduction plant in Apalachicola, Fla., limited the operation of these vessels. Approximately 1,400 tons were produced by the three vessels in a period of approximately 4 months, even though the actual fishing time was limited to less than 45 days.

OUTLOOK FOR THE FUTURE

The development of the thread herring fishery in the Gulf of Mexico, as an adjunct of the industrial fish industry, is dependent upon such factors as a stabilized world market for fish meal, oil, and solubles and an increased demand for raw materials for the petfood industry. Thread herring for reduction to fish meal, oil, and solubles have been proven to be of satisfactory quality, and the operation has been shown to be economically profitable under normal market conditions. As raw material for petfood, thread herring are commercially acceptable.

There is also the possibility that thread herring could be packed sardine-style, as a food item. Development of a thread herring "sardine fishery" is dependent upon establishment of facilities and markets. Experimental canning has indicated that thread herring produce an acceptable product when canned in oil, tomato sauce, and other usual types of sardine packs. Continued research and experimental work is being undertaken by the Bureau and the commercial industry to further evaluate the apparent great potential of this source of protein from the Gulf of Mexico.

SUMMARY

The growth of the fish-reduction industry since 1939 and the establishment and growth of the petfood industry in the Gulf of Mexico has created a demand for industrial fish. The presence of abundant stocks of thread herring in the Gulf offers a potential resource as a supplement to existing industrial fish stocks. The exploratory and experimental work of the Bureau and the industry in effecting suitable fishing techniques and gear and the development of uses for thread herring, serve as a foundation for future development of the thread-herring fishery in the Gulf of Mexico.

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BEHAVIOR OF ELECTROLYTIC TINPLATE AS CONTAINER FOR MEAT AND FISH

Beef in gelatin and tuna in olive oil were packed, according to commercial canning techniques, in cans of Ferrostan electrolytic tinplate No. 50, with normal or anodic passivating electrochemical treatment, with or without interior sulphur-resisting lacquer coating. From the technical point of view, this type of tinplate has proved to be quite suitable for canning the two products. From the aesthetical point of view, the tinplate passivated by the anodic treatment, whether plain or lacquered, was found to be unsuitable for canning beef, while only the plain tinplate passivated by the same treatment turned out to be unsuitable for canning tuna. In all the other cases, the sulphite discoloration of the tinplate either was practically absent or did not exceed, in extent and nature, that normally occurring on hot-dipped tinplate cans containing the same products. (Industrie Conserve, vol. 35, no. 1, 1960, pp. 7-11.)

TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 10-- A SEA SLED TO TOWING VESSEL COMMUNICATION METHOD:

For some types of fishing gear research, SCUBA divers employ a diving sled towed by the vessel towing the gear being studied (Sand 1956, Holt 1960). This technique permits continuous observation, photography, and measurement of gear under normal operating conditions. Lack of communication between divers and the towing vessel is a serious limiting factor in operations in which sleds are used. The U. S. Bureau of Commercial Fisheries Gear Research Unit at Pascagoula, Miss., has recently developed a one-way communication method as a partial solution to this problem (fig. 1).

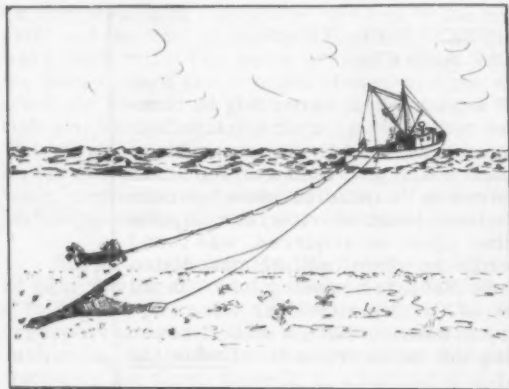


Fig. 1 - A pictorial view of the sea sled in use. The communication conductor runs from the vessel to the sled along the towing cable.

The method utilizes the following equipment (fig. 2).



Fig. 2 - The bridge-mounted signal bell, 12-volt d.c. power supply, and the sled-mounted signaling switch with watertight connector attached. An electrical conductor (not shown) connects these components.

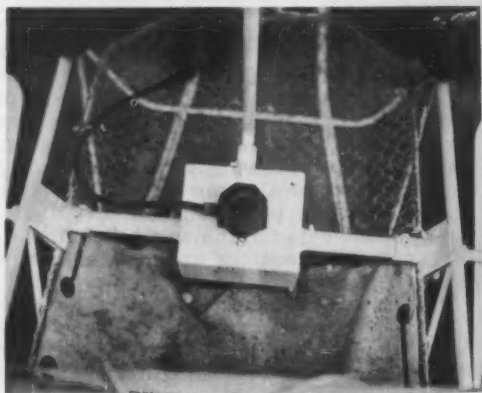


Fig. 3 - Signaling switch mounted on the sea-sled control box.

A signal button; a 12-volt d.c. power supply; a standard 12-volt alarm bell; and an

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FISH AND WILDLIFE SERVICE
SEP. NO. 629

electrical conductor between components. The signal button is filled with castor oil so that water pressure will not set off the signal and so that water will not enter the button. The signal button is located on the control box of the sled and is joined to the electrical conductor through a watertight connector (fig. 3). The conductor is standard 750-ohm television aerial lead-in wire with metal rings attached at 2-fathom intervals. The sled towline, which runs from one drum of the trawling winch, passes through all of the rings. The unused length of conductor is kept folded at the stern where it is suspended from the rings (fig. 4). The power supply and signal bell are mounted on the bridge.

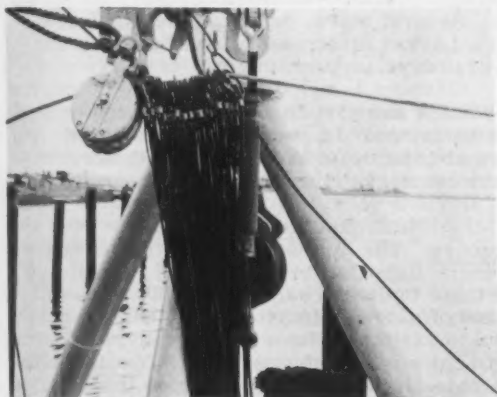


Fig. 4 - The conductor wire hanging from its supporting rings. The sea-sled towline passes through all of the rings.

A signal code, prepared before the divers enter the water, is used to transmit the wishes of the divers to the crew of the towing vessel. In this way changes affecting speed, wire scope, or other factors can be made effectively and simply without the time-consuming necessity of surfacing. The method also is an improvement in diving safety procedures, in that the vessel can be signaled immediately in the event of an accident to one of the divers or to equipment.

The primary deficiencies of the method are that communication is possible in one direction only and the number of prearranged operations permitted is limited owing to the necessity of keeping signals simple.

--By John K. Holt
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Division of Industrial Research,
U. S. Bureau of Commercial Fisheries,
Pascagoula, Miss.

California

AERIAL CENSUS OF SEA LIONS:

Airplane Spotting Flight 61-7-Sea Lion Census: An aerial survey of the coast and offshore islands from Pismo Beach and the Oregon border to Pt. Conception was conducted by the California Department of Fish and Game Twin Beechcraft on June 6-9, 13, and 19, 1961, to estimate the abundance of sea lions in California. Significant concentrations of sea lions were found on Turtle Rocks off Patrick Point, Sugar Loaf off Cape Mendocino, Sea Lion Rocks off the Mattole River, Jackass Gulch south of Shelter Cove, Cottaneva Needle near Cape Vizcaino, rocks off Fort Ross, Point Reyes, Farallon Islands, Ano Nuevo Island, Santa Cruz Point, Partington Point, Cape San Martin, Point Piedras Blancas, West end of San Miguel Island, Santa Barbara Island, San Nicolas Island and the west side of San Clemente Island. Individuals and lesser numbers were found intermittently between those places.



California sea lions on Twin Rocks, Laguna, Calif.

Photographic equipment used included a 9" x 9" vertical aerial camera mounted in the floor of the Beechcraft, a K-20 manually-operated aerial camera, and a 35-mm. color camera. Photographs were taken wherever significant concentrations of sea lions were encountered. Actual counts and estimates were made in areas where only small numbers of animals were found.

Weather conditions, for the most part, were ideal and the census was completed without undue delay because of coastal fog so often present in the past during June.

ALBACORE TUNA OFF CALIFORNIA AND BAJA CALIFORNIA STUDIED:

M/V "Alaska" Cruise 61-A-4-Albacore: The high seas off California and Baja California between Monterey and Guadalupe Island from latitude $29^{\circ}00' N.$ to $36^{\circ}40' N.$ and offshore to longitude $141^{\circ} W.$, were surveyed by the California Department of Fish and Game research vessel Alaska from May 9-June 13, 1961. The objectives were (1) to explore the offshore area in an attempt to intercept and determine the migration route of albacore approaching the Pacific Coast fishing grounds; and (2) to describe environmental conditions, relative to albacore occurrence, by collecting various physical and biological data.



M/V Alaska Cruise 61-A-4-Albacore (May 9-June 13, 1961).

Approximately 3,000 of the 3,400-mile vessel track were fished with surface trolling gear. No albacore were caught or observed in the area covered.

Temperatures in most of the survey area were suitable for albacore. The warmest sea-surface temperature recorded was $65.1^{\circ} F.$ some 1,140 miles west of San Pedro (latitude $33^{\circ}30' N.$, longitude $139^{\circ}34' W.$). The coolest was $57.2^{\circ} F.$ about 240 miles west of San Pedro (latitude $33^{\circ}45' N.$, longitude $123^{\circ}01' W.$)

A total of 109 bathythermograph casts to 450 feet was made, each at approximately 20-mile intervals. Sea-water samples for

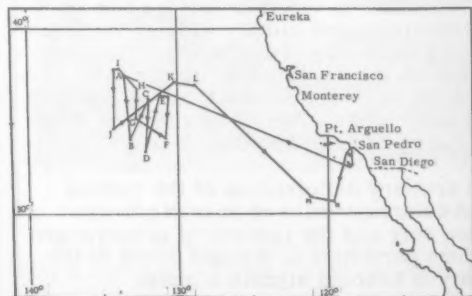
salinity analysis were collected by means of 10-meter Nansen bottle casts at alternate bathythermograph stations.

Eleven night-light stations were occupied. Pacific sauries, Cololabis saira, were present at all stations. Jack mackerel, Trachurus symmetricus, to 20 inches in length were observed at several stations east of longitude $130^{\circ} W.$ A few lanternfish, Myctophum affine, and several unidentified squid and salps were present at nearly all stations. A pelagic shark (Euprotomiscus bispinatus) was collected about 1,000 miles offshore.

Daytime observations were logged frequently. Blackfooted albatross were numerous. Several storm petrels were sighted, and a Laysan albatross followed the boat for several days.

Whales and porpoise were observed on two occasions. Japanese glass net floats were abundant in some areas particularly in the central portion of the survey area.

M/V "N. B. Scofield" Cruise 61-S-3-Albacore: The high seas off California and northern Baja California between Point Reyes and Cape Colnett from latitude $30^{\circ} N.$ to $40^{\circ} N.$ and offshore to longitude $135^{\circ} W.$, were surveyed (May 19-June 17, 1961) by the Department's research vessel N. B. Scofield. The objectives were (1) to explore this offshore area in an attempt to intercept and determine the migration route of albacore approaching the Pacific Coast fishing grounds; and (2) to describe environmental conditions, relative to albacore occurrence, by collecting various physical and biological data.



M/V N. B. Scofield Cruise 61-S-3-Albacore (May 19-June 17, 1961).

Surface trolling gear was used to fish along more than 75 percent of the 3,200-

mile vessel track. No albacore were caught and there was no evidence of their presence in the area covered.

Sea-surface temperatures in most of the survey area were suitable for albacore. A thermograph provided continuous records of sea temperature approximately 6 feet below the surface. At the surface and at 10-meters, temperatures were obtained at regular intervals with bucket and reversing thermometers. At all 3 near-surface depths the coolest water (53° to 54° F.) was encountered early in the survey west of San Clemente, San Nicolas, and Santa Cruz Islands. Warmest temperatures (64° to 66° F.) at these depths were encountered 300 to 500 miles west of San Francisco.

A total of 145 bathythermograph casts to a depth of 450 feet were made at approximately 20-mile intervals throughout the survey. Nansen bottle casts to 10-meter depths were made generally at alternate bathythermograph stations or at about 40-mile intervals. A water sample for salinity analysis and a reversing thermometer record were obtained at 81 stations.

Weather conditions were excellent for the most part. Of 146 observations, only 6 percent showed northwest winds in excess of 20 knots.

A night-light station was occupied on 14 occasions while the vessel drifted on sea anchor. Pacific sauries, *Cololabis saira*, were observed at every station in numbers varying from 6 to several hundred. A small sample was obtained from each station. Several lanternfish, *Myctophum affine* and *Centrobranchus nigroocellatus*, a juvenile jack mackerel, *Trachurus symmetricus*, one small shark (*Euprotomiscrus bispinatus*), a medusafish, *Ichthyos lockingtoni*, and many invertebrates also were collected.

Daytime observations were logged frequently. The blackfooted albatross was the most common bird sighted offshore. Also observed were 3 species of storm petrels, some shearwaters, some terns, a jaeger, and a white albatross. Blue sharks were observed on several occasions. Marlin were seen jumping twice. A large pack of killer whales were observed about 300 miles west of San Francisco. Numerous Japanese glass net floats of various sizes were observed west of the 135th meridian.

* * * * *

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruises 61-N-11 and 61-N-12-Salmon: The midwater trawl operations of the California Department of Fish and Game research vessel *Nautilus* were continued (June 5-9 and June 19-23, 1961) in the Carquinez Strait to capture marked salmon fingerlings. All midwater trawling for marked salmon fingerlings was conducted between 7 a.m. and 3 p.m. and each tow was for 20 minutes. Tows were alternated between upstream and downstream, and between the north shore, center; and south shore of the channel. A flow meter was used to measure the amount of water strained by the net on each tow.

During the 92 tows completed, a total of 309 king salmon (*Oncorhynchus tshawytscha*) fingerlings was captured--catch per tow varied from zero to 22. A total of 17 marked salmon was recovered, 15 from releases made at Rio Vista, 1 from releases made in San Pablo Bay (approximately 2 miles seaward of the fishing area), and 1 from releases made at Coleman Hatchery. Two rainbow trout (*Salmo gairdneri*) were also taken; one of these was marked and had been released in the American River.

Other species appearing in the catch, listed in order of abundance, were: northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallasii*), striped bass (*Roccus saxatilis*), American shad (*Alosa sapidissima*), jack smelt (*Atherinopsis californiensis*), Northern midshipman (*Porichthys notatus*), and starry flounder (*Platichthys stellatus*).

One trip was made outside the Golden Gate along Baker Beach. Three trawls were made in the area between Mile Rock light-house and the Golden Gate bridge. The first set offshore from Baker Beach at the surface produced 1 fingerling salmon. The second set in the same area with diving doors--net at approximate depth of 50 feet--produced 29 salmon. The third set away from the beach in deeper water with the net at approximately 60 feet produced no salmon. On the return to Carquinez Strait, one set was made east north-east of Angel Island. No salmon were caught in this area.

Note: Also see *Commercial Fisheries Review*, Aug. 1961 p. 19.



Cans--Shipments for Fishery Products, January-May 1961

Total shipments of metal cans during January-May 1961 amounted to 52,940 short tons of steel (based on the amount of steel



consumed in the manufacture of cans) as compared with 49,682 tons in the same period a year ago. Canning of fishery products in January-May this year was confined largely to tuna, shrimp, Gulf oysters, and jack and Pacific mackerel.

Notes: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1961:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, about 1.9 million pounds (value \$988,000) of fresh and frozen fishery products were purchased in April 1961 by the Military Subsistence Supply Agency. This was higher than the quantity purchased in March by 21.3 percent and 15.6 percent above the amount purchased in April 1960. The value of the purchases in April this year was up 40.9 percent as compared with March and was 3.1 percent higher than for April a year ago.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, April 1961 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
1,902	1,646	7,069	6,894	988	958	3,535	3,688

During the first 4 months of 1961 purchases totaled about 7.1 million pounds (valued at \$3.5 million)--an increase of 2.5 percent in quantity, but lower by 4.1 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in

April 1961 averaged 51.9 cents a pound, about 7.2 cents above the 44.7 cents paid in March and 6.3 cents less than the 58.2 cents paid during April last year.

Canned Fishery Products: Tuna was the principal canned fishery product purchased

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, April 1961 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
Tuna	1,297	13	2,662	1,282	572	8	1,175	581
Salmon	2	-	2	-	2	-	2	-
Sardine	21	15	81	61	10	6	39	26

for the use of the Armed Forces during April this year. In the first 4 months of 1961, purchases of canned tuna were up 107.6 percent from the same period of 1960.

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1961:

Fresh and Frozen Fishery Products:

For the use of the Armed Forces under the Department of Defense, 2.2 million pounds of fresh and frozen fishery products were purchased in May 1961 by the Military Subsistence Supply Agency. This was higher than the quantity purchased in April by 16.2 percent and 3.9 percent above amount purchased in May a year ago. The value of the purchases in May this year was up 8.7 percent as compared with April, but was 2.6 percent less than for May last year.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, May 1961 with Comparisons

QUANTITY				VALUE			
May		Jan.-May		May		Jan.-May	
1961	1960	1961	1960	1961	1960	1961	1960
..... (1,000 Lbs.) (\$1,000)			
2,210	2,128	9,279	9,022	1,074	1,103	4,609	4,791

During the first 5 months of 1961 purchases totaled 9.3 million pounds (valued at \$4.6 million)--an increase of 2.8 percent in quantity but a decrease of 3.8 percent in value as compared with the same period in 1960.

Prices paid for fresh and frozen fishery products by the Department of Defense in May 1961 averaged 48.6 cents a pound, about 3.3 cents less than the 51.9 cents paid in April and 3.2 cents less than the 51.8 cents paid during May last year.

Canned Fishery Products: Canned sardines was the only canned fishery product purchased for the use of the Armed Forces during May this year. In the first 5 months of 1961, purchases of canned sardines were

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, May 1961 with Comparisons

Product	QUANTITY				VALUE			
	May		Jan.-May		May		Jan.-May	
	1961	1960	1961	1960	1961	1960	1961	1960
	... (1,000 Lbs.) (\$1,000) ...			
Tuna	-	1	2,662	1,283	-	1/	1,175	581
Salmon	-	-	2	-	-	-	2	-
Sardine	8	1	89	62	4	1/	43	26
U/Valued at less than \$500.								

up about 43.5 percent and canned tuna purchases were up 107.5 percent as compared with the same period in 1960. Only 2,000 pounds of salmon was purchased during first five months of 1961 as purchases of this product are usually made in the fall months or about at the end of the spring and summer salmon canning season.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Films

SPONGE FILM SELECTED FOR INTERNATIONAL SHOWINGS:

Another U. S. Department of the Interior film, *Sponge--Treasure from the Sea*, has been selected for showing at internationally prominent film festivals. The film was sponsored by the Sponge and Chamois Institute and produced by the U. S. Bureau of Commercial Fisheries. It has already received honors at the American Film Festival.

Sponge--Treasure from the Sea is a sound-color portrayal of the natural sponge industry in the United States. Most of it was filmed at Tarpon Springs, Fla., the center of the natural sponge industry in this country. Old World ceremonies and music add interest to the picture.

The film has been selected for showing at the Edinburgh, Scotland, International Film Festival and at the Venice, Italy, International Film Festival where it vies for honors with films from more than 35 countries. Selections of United States Government films for international showing are made by the Inter-Departmental Committee



Vessels operating in the sponge fishery docked at Tarpon Springs, Fla., with their harvest of sponges. Sponges are being hung out to dry.

on Auditory and Visual Aids for Distribution Abroad. Arrangements for showing Government films at foreign film festivals are made by the U. S. Information Agency and the Department of State.

For the Edinburgh showing there will be a prescreening in London and another preview in Edinburgh before final selection. There is also a prescreening step at Venice.

Three Bureau of Commercial Fisheries films have won awards at Edinburgh and three in Venice.

Note: See *Commercial Fisheries Review*, Jan. 1961 p. 34.



Fisheries Loan Fund

LOANS APPROVED, APRIL 1-JUNE 30, 1961:

From the beginning of the program in 1956 through June 30, 1961, a total of 961 applications for \$28,949,169, have been received. Of these, 511 (\$12,013,809) have been approved, 328 (\$8,606,482) have been declined or found ineligible, 90 (\$5,104,066) have been withdrawn by applicants before being processed, and 32 (\$1,961,455) are pending. Of the applications approved, 196 were approved for amounts less than applied for and the total reduction was \$1,263,357.

The following loans were approved April 1-June 30, 1961:

New England Area: Bluewaters, Inc., Gloucester, Mass., \$80,000; Ruth and Helen, Inc., Newport, R. I., \$15,000; Sunapee, Inc., North Dartmouth, Mass., \$21,000; and Wilhelmssen Fishing Corp., North Dartmouth, Mass., \$40,700.

South Atlantic and Gulf Area: Gail Emma, Inc., Tampa, Fla., \$22,000; E. L. Gant, Port O'Connor, Tex., \$8,600; Jackson Seafood Co., Rockport, Tex., \$25,000; J. H. Morgan, McIntosh, Ga., \$5,000; Warren H. Rector, Awendaw, S. C., \$8,000; Sea Cat, Inc., Tampa, Fla., \$17,000; Thomas A. Smirch, St. Augustine, Fla., \$19,800; St. George Seafood Co., Inc., Tampa, Fla., \$24,100; and Lathan Willis, Harkers Island, N. C., \$9,600.

California Area: Charles H. Hastings, Eureka, \$9,500 and Charles L. White, San Diego, \$3,000.

Hawaii Area: M. Hamabata and S. Tokumine, Honolulu, \$4,000 and Tatsuo Hayashi, Honolulu, \$5,400.

Pacific Northwest Area: Wm. J. and J. T. Haavisto, Ilwaco, Wash., \$7,690; John Honegger, Portland, Oreg., \$10,000; Ernest A. Peterson, Astoria, Oreg., \$2,000; Donald Truex, South Beach, Oreg., \$6,500; and Wm. H. Wood, Seattle, Wash., \$14,000.

Alaska: John M. Griffin, Ketchikan, \$6,500.

Fishing Vessel Mortgage and Loan Insurance

CASES APPROVED, APRIL-JUNE 1961:

The Federal Fishing Vessel Mortgage and Loan Insurance Program was implemented the latter part of 1960 as a result of enabling legislation passed by the Congress in that year. Administered by the U. S. Bureau of Commercial Fisheries, the program provides for Federal Government insurance of mortgages and loans for construction, reconstruction, and reconditioning of fishing vessels. The first three insured mortgages and loans under the program were approved prior to April 1, 1961. During the April-June 1961 period the following insured mortgage and loan was approved:

New England Area: Sylvester Maloney, New Bedford, Mass., \$60,000.

Fish Flour

STATEMENT BY CONGRESSMAN KEITH:

A statement on fish flour made by Congressman Hastings Keith of Massachusetts was published in the Congressional Record appendix of June 19, 1961. The principal portion of the statement follows:

Use of fish and marine animals as a source of protein has been seriously hampered by inferior means of harvesting, processing, and storage. But, now, with more advanced fishing techniques and more than 5 years of experimentation, a practical method has been perfected to meet the urgent demand to supply the two billion undernourished people of the

world with an abundant and inexpensive source of protein to supplement their native diets.

This remarkable new food from fish could be of first-line importance to the stepped up freedom from hunger campaign of the United Nations and our own food for peace program—one of the agencies which may be used to combat the crucial situation in Brazil. It could also, conceivably, be a major boon to the ailing American fishing industry.

Known as whole fish flour, it is more accurately described as fish protein concentrate, and appears to be the most efficient product yet developed for converting protein from the sea into human food.

A tasteless and odorless powder, fish flour is made from the whole fish and is the world's cheapest, most abundant and biologically richest source of animal protein—two and a half times the food value of milk powder at the same cost. One of its chief qualities is an ability to withstand adverse storage conditions, and it is particularly suited to the unrefrigerated facilities of the tropics. As a human food it has growth-promoting characteristics that surpass even the widely used flour made from soybeans.

The VioBin Corp. of Monticello, Ill., a pharmaceutical preparation company, has set up a pilot plant for the production of fish flour in New Bedford. Early cost estimates indicate it can be successfully produced at a price of only 14 cents a pound, with a protein content in excess of 80 percent by weight.

Considering the great world need for protein of high quality, the market for fish flour is limitless. The source, too, is virtually inexhaustible, as the raw material is not prime fish—commercially marketed—but sizes and species of fish which until now have been cast from the nets as worthless by the industry.

The exciting potential of such a food is illustrated by the fact that 1 million tons of fish flour could provide the annual protein requirements of 100 million people.

This food supplement is now being used and tested on a limited scale in 48 nations. In cooperation with ICA and various other organizations it has undergone exhaustive study. In El Salvador, where one such test was conducted, the introduction of fish flour into the native diet brought amazing results. Mixed with other foods, it "markedly increased the rate of weight and height gains in children exhibiting various degrees of malnutrition and tended to increase the resistance of the subjects against illnesses and intercurrent infection."¹

This should be wonderful news—a genuine breakthrough in the age-old fight against hunger and illness.

Unfortunately, however, there is still a serious obstacle to the worldwide distribution of fish flour. As a new food product, this dietary supplement is subject to the approval of the Food and Drug Administration. Such approval has been withheld because the FDA takes the position fish flour is "adult-erated" and therefore unfit for human consumption because it is made from the whole fish. Our sources report this is not a health question, but what has been termed an "esthetic judgment."

¹ From a report published in 1959 by the University of El Salvador's Instituto Tropical De Investigaciones Científicas.

FDA has argued the average American consumer would reject fish flour as a food on esthetic grounds. In defense, proponents point out that the use of whole fish—dried, defatted, deodorized and reduced to a fine powder—should be more attractive from an esthetic standpoint than oysters, sardines, clams and other seafoods which we all enjoy and which are eaten whole or often contain the viscera.

In an effort to satisfy FDA that fish flour will be a uniform, high-quality product for the benefit of the consumer and that the consumer would be protected by accepted food handling techniques and standards of sanitation, a strict "standard of identity and definition for whole fish flour" is being prepared. These standards are being drawn up by the Bureau of Commercial Fisheries in conjunction with the manufacturer, Dr. Ezra Levin, and Harold Putnam, counsel for the Senate Select Committee on Small Business.

It is anticipated FDA will publish the standards in the Federal Register and subsequently conduct a public hearing on the question of whether whole fish flour should be permitted to be marketed for human consumption in the United States. The hearing will probably be this fall.

At such a hearing, the weight of public opinion will, of course, play a vital role in obtaining a favorable decision, as will the amount of support received from Members of Congress, the administration, and health and nutrition experts.

It is particularly important, if only from a psychological standpoint, that this health-giving discovery have the full endorsement of the U.S. Government before we attempt to distribute it to underdeveloped countries, where the need is greatest and where field tests are now being conducted with fish flour by U.S. agencies or agencies which are sponsored in part and endorsed by the United States.

Its value in such a program as food for peace, in Brazil or elsewhere, would be utterly destroyed if it carried overseas a labeling branding it "unfit" for Americans, even though a present exemption in our law allows for exportation.

In a joint statement issued by Senators SALTONSTALL and SMITH of Massachusetts, it was rightly pointed out that in the development of this protein-rich food there has been no scientific "lag" by the United States. They added:

All the information we have indicates we are years ahead of the Soviet Union. But, it is important that we stay ahead.

If we do not push boldly on, we expect Russia will be ready in a short time with an acceptable process and once its fish flour is available we are sure there will be no delay in Russia pouring its production out to all corners of the hungry earth.

Fish flour offers great promise to our foreign policy by helping in a positive sense those people President Kennedy spoke of in his Inaugural Address, "in the huts and villages of half the world, struggling to break the bonds of mass misery."

Its continued development and effective production is a challenge to us and to our fishing fleets. The profitable use of that untapped mine of industrial fish in waters off our shores presents a dramatic possibility, as well, for the domestic economy.

However, all the significant benefits of fish flour can be lost. The officials who must make the final judgment as to its desirability as a human food must be assured that an "aesthetic objection" alone—if indeed one exists—should not delay the worldwide distribution of a product that could become a singularly effective weapon in our global war for peace.



Fish Meal

VARIABLE QUALITY THEORY BEING TESTED:

Chick-feeding tests on 7 samples of fish meal obtained from Gulf of Mexico menhaden plants were completed as of June 1961 by the College Park (Md.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The tests showed (1) an extremely wide range in quality for such a small series; (2) excellent correlation to the quality predicted from the knowledge of sample histories. This prediction was based upon the application of the hypotheses developed from the findings of last season's meal-testing program.

Sufficient additional samples had been received in June from plants visited to start a second test series. This series, it is hoped, will substantiate the theories explaining variable meal quality and enable the recommendation of processing changes to eliminate the variables in fish meal quality.



Freezing-Fish-at-Sea

NEW FREEZING SOLUTION SOUGHT:

That groundfish (cod, haddock, hake, pollack, etc.) can be satisfactorily preserved by brine-freezing at sea has been demonstrated by research at the Gloucester (Mass.) Technological Laboratory of the U. S. Bureau of Commercial Fisheries. Sodium chloride brine, however, has serious drawbacks, and a new freezing medium is needed.

The Gloucester Laboratory has let a contract to the University of New Hampshire on "Development of Solutions for Immersion-Freezing Fish at Sea." Research efforts will be directed toward finding inexpensive or easily refinable and re-usable

solutions that are non-toxic, have a freezing point around 20° F. and have a low viscosity at low temperatures. Solutions approaching these requirements will be tried on a laboratory and pilot-plant scale.



Frozen Foods

CODE ADOPTED BY AFDOUS:

Over 250 regular and associate members of the Association of Food and Drug Officials of the United States (AFDOUS) convened at their 65th Annual Conference on June 19, 1961, in Washington, D. C. The meeting ended on June 23. Of particular interest to the frozen fish industry was the action taken by the Conference on the regulations of frozen foods. The Association adopted the Frozen Foods Code.

The 64th Annual Conference at Dallas, Tex., adopted the Report of the Frozen Foods Standards subcommittee which recommended that eight sections of the Frozen Foods Code be forwarded to the Committee on Editing and Format in order that they be put in final form for passage in 1961. These sections included provisions for retail, warehousing, transportation, construction and layout, equipment, and frozen food handling in general. Since it was deemed that additional scientific data were needed, no provisions for bacterial limits were made.

The Canned, Processed and Frozen Foods Committee of AFDOUS convened in Washington during the Conference at which time copies of the proposed code as prepared by the AFDOUS Subcommittee on Editing and Format were reviewed and comments of the Editing and Format Subcommittee, as well as those of the Frozen Foods All-Industry Coordinating Committee were given full consideration. A list of changes, considered to be justified by the Committee, was prepared and made a part of the code. The Voluntary Industry Operating Practices which was prepared by the Frozen Foods All-Industry Coordinating Committee were reviewed and it was generally agreed by the AFDOUS Committees that the industry operating practices followed very closely the AFDOUS Code in temperature requirements. The Industry Voluntary Operating Practices for Transportation Equipment will equal the AFDOUS Code requirements by 1963 and call for 0° F. with a 5° F. tolerance by 1965, which tolerance is 5° F. lower than the permitted tolerance in the AFDOUS Code.

The AFDOUS Committee on Canned, Processed and Frozen Foods reaffirmed its views that a voluntary industry self-policed program cannot substitute for an AFDOUS Code. The 20° F. tolerance for delivery trucks and the statement that new refrigerated transportation equipment, purchased after March 1, 1961, will be capable of achieving only 5° F. temperatures, were the principal weaknesses in the Voluntary Industry Practices, according to the AFDOUS Committee. The Committee felt that since 0° F. is the industry goal, equipment purchased after the AFDOUS Code is adopted should be capable of holding frozen foods at 0° F.

The Committee then made the following recommendations which were adopted by the Association: "(1) In the absence of adequate information for the establishment of bacterial limits for frozen foods, the Committee recommends that this question be referred to a subcommittee of microbiologists, to be appointed by the Chairman, to develop definitive recommendations on this subject. Under a broad charter this subcommittee would be concerned with further simplification and development of uniform methods of analysis and the interpretation of the microbiological findings obtained; (2) the Committee recommends that the proposed Frozen Foods Code as prepared by the Subcommittee on Editing and Format and



Peeled deveined shrimp laid out individually on large trays. Trays are placed in a roller rack holding 15 trays. Full rack being wheeled into blast freezer for freezing.

as amended by the Canned, Processed and Frozen Foods Committee, be accepted by AFDOUS and published in the Association's *Quarterly Bulletin*. The Committee further recommends that at the time it is published, it be made available to States and Municipalities for their adoption."

Members of the fishing industry should take particular note of the Committee's report to the Association, that a "self-policing program cannot substitute for an AFDOUS Code." It is now the goal of the majority of the membership of AFDOUS to go back home and start the ball rolling to enact implementing legislation.



Fur Seals

INTERNATIONAL TREATY NEGOTIATED 50 YEARS AGO:

Fifty years ago steps were taken which saved a remnant seal herd in the North Pacific from probable extinction and built it into a valuable and continuing resource, the Secretary of the Interior announced on July 2.

It was on July 7, 1911, that four nations--Japan, Russia, Great Britain (for Canada), and the United States--signed the fur seal treaty ending the killing of fur seals on the high seas in the North Pacific and providing a formula for sharing the kills made on rookeries. Provisions for policing the treaty were included. The clause which ended pelagic sealing cleared the way for an effective conservation program and provided the basis for the United States to initiate effective

tive conservation practices on the Pribilof Islands fur seal rookeries.

World War II disrupted this first treaty agreement but on February 9, 1957, the four nations (Canada signing for Canada) signed a new treaty which became effective in October of that year. A Canadian-United States agreement had been in effect during the interim period. The new treaty was similar in most respects to the old one--pelagic sealing was banned except for certain research operations and for natives using primitive methods and using the harvest for sustenance; the principle of sharing the harvest on the rookeries was maintained but the formula changed somewhat; policing was provided; and a new coordinated research program was instituted which made possible not only research on a single herd but provided for studies to determine whether or not there was any interrelationship between the various North Pacific fur seal herds.



Fig. 1 - "Fur seals sporting around the baidarra--Natives of St. Paul lightering off the bundled sealskins to the ship from the Village Cove." A sketch by Henry W. Elliott, who visited the Pribilofs for the Treasury Department and the Smithsonian Institution in 1872, shortly after purchase of the islands from Russia. The baidarra, or bidarra, was made of sea lion skins; canvas-covered bidarrahs are still used in ship-to-shore ferrying.

In the 1911 treaty, the rookery-owning nation kept 70 percent of the harvest and the other 30 percent was divided among the other nations. In the present treaty, Japan and Canada each got 15 percent of the United States harvest on the Pribilof rookeries and a like percentage of the Russian harvest on Robben Island and Commander Islands off the Asian coast. The Pribilof herd supplies about 80 percent of the world's production.

As a result of conservation practices which the United States put into effect shortly after the signing of the 1911 treaty, the Pribilof herd has increased from approximately

132,000 in 1910 to 1,500,000 at the present time.



Fig. 2 - Breeding grounds of the northern fur seals: Robben Island (Kaihyōtō or Tyuleniy Island) off Sakhalin; the Commander Islands (Bering Island and Medny or Copper Island) at the Soviet end of the Aleutian chain; and the Pribilof Islands--St. Paul Island, St. George Island, Otter Island, Walrus Island, and Sea Lion Rock.

There are five islands in the Pribilof group in the Bering Sea about 300 miles off the Alaska coast. The two largest are St. Paul, 14 miles in length, and St. George, 10 miles in length. The two islands are about 40 miles apart. Although Alaska was visited by Vitus Bering, Russian navigator, in 1741 and a great number of "sea bears" reported, it was not until 1786 that Gehrman Pribylof, another Russian navigator, discovered the islands which bear his name and which contain the great fur seal rookeries.

There are four periods of sealing history in the Pribilof Islands. The first such period of history began with the date of discovery and continued until 1834 when, because of the reduction of the herd, the Russian government placed restrictions on sealing operations. During that 48-year period, records show that two million fur seals were taken.

The second period is between 1834 and 1867, the year the Russians sold Alaska, including the Pribilofs, to the United States. During that time because of the reduced herd and restrictions about 600,000 skins were taken.

The third period began with the United States ownership and control of the islands and continued until 1910, a period marked by the practice of harvesting by contract or lease. From 1870 until 1890 the limit of kill

was 100,000 seals a year. This limit was reached practically every year, for the record shows that there were 2,006,136 seals taken and that the United States received \$6,020,152 in revenue. Then followed a drop in seal population and a corresponding drop in harvest. Only 330,603 seals were killed from 1891 to 1910 and the revenue was \$3,453,944.

But this third period was marked by two other significant situations. During the first two years of United States control there was indiscriminate killing with 225,901 skins taken on the rookeries by independent operators. Pelagic sealing began on a commercial scale about 1871, reaching a peak in 1894 when 61,800 seals were taken at sea. The actual number killed in pelagic sealing but not recovered in any year, or the number of seals which were wounded but escaped to die of injuries later, cannot be estimated.

The fourth and present period of Pribilof sealing is marked by direct management of the resource by the United States Government and the institution of scientific conservation practices.

When pelagic sealing was outlawed by the four nations, the door was opened to conservation of the rookeries. The United States immediately banned all killing on the Pribilofs for five years except that the natives were permitted to kill for food supply. This meant that only 2,500 to 3,500 seals were killed a year. Killing was resumed in 1918 and the records show that 34,890 skins were taken. Under the policy which had been established the killing was (and still is) done by Government employees and was restricted to the harvest of bachelor males of the three- and four-year-old class.

Females were given complete protection until 1955 when the biological studies indicated that the herd--scientifically estimated at 1,500,000--had stabilized at that figure and that disease and other natural causes were taking any excess. This meant that the time had come to end the protection which had been given the female and that henceforth the annual harvest of female would, under close supervision of the biologists, be standard management practice.

The seal take for the ten years ending in 1955 had been approximately 65,000 annually. Since the killing of females started, the an-

nual harvest has fluctuated because biological research on this phase of management is still in progress. The largest kill was in 1956; a total of 122,826 skins was harvested.

The economics of the fur seal is a story of its own. Until 1913 all raw seal skins were shipped to London for processing, for that art was known only to a small group of skilled English workers. When some of these workers were induced to come to the United States, a new American industry was born. It was located in St. Louis, Mo. The processing of a skin involves about 125 distinct operations. Each skin is handled separately.

With the taking of female skins a new problem was created. The process used in the preparation of male skins was not satisfactory for female skins. Intensive research followed and a sheared skin is now offered to the fur trade.

While the Government has retained all responsibility on each phase of the conservation and production of the seal resource, it has found it advantageous to contract the processing to a private firm, the Fouke Company of St. Louis, which has the sole contract for the preparation of the skins offered at the semi-annual auctions. These auctions are held in St. Louis each April and October. The receipts come to the Government after the contractual obligations are met.

The number of skins offered by the Government varies but approximates 25,000 at each sale. The price varies with the year and with the class of skin but the average approximates \$100 each.

Gross receipts from the sale of Pribilof Islands' products in fiscal years 1959 and 1960 amounted to \$9,201,182. Of this, \$3,096,129 was used to cover costs for handling, dressing, dyeing, and selling these products; \$3,442,308 was used to cover costs in administration of the Pribilof Islands; and \$1,863,921 represented net receipt payments to the State of Alaska pursuant to authority contained in Section 6 (e) of the Alaska Statehood Act. Net receipt of the United States Government, therefore, was \$798,824.

Another economic phase is the meal and oil produced by the reduction of the skinned carcasses.

Then, there is the human angle, the Aleut, who was brought to the once-unpopulated is-

lands as the top harvest hand. The Aleut and his modern, Government-built towns, the schools and the relocation problem for those whom the sealing industry will not support, is still another story.

This, then, is a brief sketch of an industry and a resource which can continue far into the future--the result of an action consummated on July 7, 1911.

Note: A complete summary of Pribilof Islands sealing operations is contained in Fishery Leaflet 516, "Fur Seal Industry of the Pribilof Islands," available from the U. S. Bureau of Commercial Fisheries, Washington 25, D. C.



Game Fish

PACIFIC MARINE GAME FISH RESEARCH LABORATORY PLANNED:

A marine game fish research center on the Pacific Coast is planned by the U. S. Bureau of Sport Fisheries and Wildlife. Application has been made to the Department of the Navy for use of unoccupied buildings at the Naval Net Depot at Tiburon, Calif., inside the Golden Gate on San Francisco Bay.

As of May 1961, initial efforts on the Pacific Coast have been on a modest scale. Temporary space has been at the University of California at Los Angeles.

Surveys of sport fishing areas, facilities, and use, which are in progress, will bring into focus the needs and problems of the Pacific Coast and will supplement the advice from state conservation departments and the Pacific Marine Fisheries Commission.



Great Lakes

EFFORTS TO UTILIZE ALEWIFE POPULATION IN LAKE MICHIGAN:

The Lake Michigan alewife is one of several species of fish in the Great Lakes that is not being fully utilized as food for other fish, such as lake trout, or by sport and commercial fishermen. These fish used to provide forage for the once-plentiful lake trout. When lake trout are reestablished, a certain part of the alewife and chub populations will be eaten by them. In the meantime, the abundant alewives and other species are

being wasted. The U. S. Bureau of Commercial Fisheries has been instrumental in introducing new types of gear that can harvest these underutilized fish economically. Traditional methods of fishing and handling are impractical as the present market value of such fish is very low compared to the more familiar Great Lakes commercial species.

The Bureau stepped into the industrial development picture of Great Lakes fisheries just a few years ago. The Bureau's activities have included: exploration to determine location and availability of underutilized fish stocks; assessment of the physical condition of fishing grounds; instructing fishermen how to use otter trawls and rig their vessels; improving methods of handling fish aboard vessels and ashore; developing new processing machinery; improving sanitary conditions; developing new products for human consumption; and locating and expanding industrial, animal, and human markets for fish. Most of this work is based on the findings of the Bureau's biologists which have conducted research on fish and their environment on the Great Lakes for many years.

Several trawl vessels are currently operating on Lake Michigan under temporary fishing permits. The newness of the fishery and its lack of stability have made it unattractive to prospective investors in the handling, processing, and marketing facilities necessary to put it on a sound operating basis. The otter trawl catches certain species of Great Lakes' fish in economical quantities, when they are sufficiently congregated and close to the lake bottom.

An example of the integrated Bureau effort to promote the use of alewives took place early in May this year. Alewives were particularly accessible at the time. Arrangements were made to catch and load a 15-ton lot of alewives aboard the *Capitol I*, a former Gulf of Mexico shrimp trawler now operated out of Saugatuck, Mich. The alewives were easily caught, with as much as 7,000 pounds taken in a single 10-minute drag. A fish pump, similar to those being used for handling menhaden on the Atlantic Coast, was used to transfer the fish from the vessel's hold to a watertight semitrailer. The trailer was provided by a Chicago firm that later reduced the alewife to meal and oil on a test basis.

The use of more efficient fishing gear could never completely remove such a fish

as the alewife from Lake Michigan. Fishing with otter trawls would become unprofitable long before the population reached a very low level of abundance. Possibilities are good, however, that alewives could be cropped to a point that would make the population healthier and reduce the spring fish kill or die-off which is objectionable in many ways.

Great Lakes commercial fisheries will find it necessary to modernize operations at every level in order to cope with changing conditions. Cooperation and encouragement should come from all quarters to help the dwindling number of commercial fishermen adopt the latest technological advancements. When this is accomplished, chances are that the Great Lakes fishing industry will once again occupy a prominent place in the business community.

If the transition comes off well, with adequate consideration given to all sides of the problem, the lakes can become more valuable from both recreational and commercial standpoints. Sensible harvesting of the great numbers of underutilized fish such as the alewife should result in better environmental conditions for popular game species as well as insure that important natural food resources are not wasted.

The appearance in June 1961 of many dead fish on the beaches and adjacent waters of southern Lake Michigan is due to a natural, seasonal fish kill or die-off of alewife. Alewife is a species of herring-like fish that invaded the Great Lakes from the Atlantic Ocean by way of the St. Lawrence River. The first published record of the alewife being in Lake Michigan was reported May 5, 1949.

The U. S. Bureau of Commercial Fisheries Regional Headquarters at Ann Arbor, Mich., reports the alewife die-off is a thing to be expected. This mass mortality is not the result of commercial fishing. The die-off occurs immediately after the spawning period when these fish are in their poorest physical condition and are particularly susceptible to the effects of disease and spring-time fluctuating temperatures.



Great Lakes Fishery Investigations

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 3: The chub (*Leucichthys* sp.) population survey in Lake Michigan was continued (June 27-July 10, 1961) by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Gangs of nylon gill nets (50 feet each of $1\frac{1}{2}$ - and $1\frac{1}{2}$ -, 300 feet each of 2-, $2\frac{3}{4}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set at 25 and 50 fathoms off Frankfort, Charlevoix, and Manistique, Mich., and Sturgeon Bay, Wis., and at 80 and 135 fathoms off Frankfort. Chub catches were light--some very light--except at 50 fathoms off Manistique where a sizable catch was made. A very large percentage of the chubs were *L. hoyi*, except in the 80- and 135-fathom sets off Frankfort, in which *L. kiyi* made up a sizable proportion. Smelt were fairly numerous in the 25-fathom set off Manistique; otherwise the gill nets produced few fish besides chubs.

Half-hour tows with a 50-foot balloon trawl were made at 25 and 50 fathoms off Frankfort; 30 fathoms off Charlevoix; 15, 25, 40, and 50 fathoms off Manistique; and 30 and 50 fathoms off Sturgeon Bay. Chub catches were generally quite small, and were made up of 98 to 100 percent bloaters. The chubs taken in the trawls in the northern end of Lake Michigan, especially off Manistique, have averaged somewhat longer than those taken in the southern portion last year.

All 50-fathom tows contained moderate numbers of deep-water sculpins (up to 18 pounds); the 15-fathom tow off Manistique took 63 pounds of smelt and 65 pounds of alewives; and the 25-fathom tow off Manistique produced 23 pounds of smelt. There were few fish other than chubs in the other tows.

Hydrographic collections and observations were made at the following locations: 40 fathoms off Frankfort, Charlevoix, Manistique, and Sturgeon Bay; 40 fathoms in midlake between Charlevoix and Manistique; and 144 fathoms in midlake between Frankfort and Sturgeon Bay. The surface water remains rather cold for the time of year. Surface temperatures ranged from 45.1 to 62.2° F. No sharp thermocline had developed in most areas. There was generally a gradual drop in temperature from just below the surface to a depth of 100 feet or more.

Note: Also see Commercial Fisheries Review, Aug. 1961 p. 28.

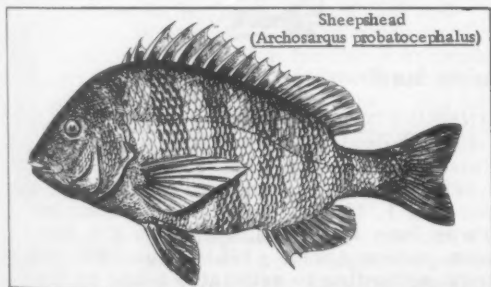
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LAKE ERIE FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" June 1961: The Lake Erie investigations of the U. S. Bureau of Commercial Fisheries research vessel Musky II during June 1961 were concentrated in Sandusky Bay and the adjacent lake area. Both the 16-foot outboard Madtom and the Musky II carried on extensive trawling. Special attention was directed toward measuring the success of this year's reproduction of fish. Quarter- and half-meter plankton nets were towed to collect eggs and fry.

About mid-June, a 5-foot sled trawl was tested but it did not prove to be an effective sampling device. Toward the latter part of the month, however, the regular trawls with $\frac{1}{4}$ -inch-mesh cod ends were capturing the larger fish of the 1961 hatch. At this stage, most young could be identified without the aid of a microscope.

The preserved collections of young-of-year fish include smelt, gizzard shad, trout-perch, spot-tail shiner, sheepshead, white bass, yellow perch, and yellow pike. Samplings at present, however, are insufficient to assess the degree of success in spawning for any of the species. It appears, nevertheless, that the hatches were generally much better than those of the past year.



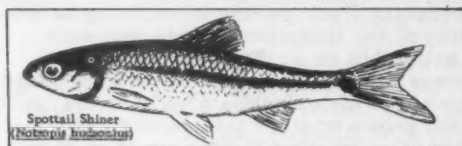
Sheepshead
(*Archosargus probatocephalus*)

The yellow pike hatch is of particular interest. More young were taken in June than in all of last year. The greatest number collected in any one day was 19--14 were from the lake and 5 from the Bay area. Although the numbers collected are still somewhat below those for the same period in 1959, the 1961 0-group yellow pike are averaging only 1.5 inches long as compared to 3 inches for the former year. Because of this smaller size, many are believed to escape through the mesh of the trawl before they reach the cod end.



Yellow Pike
(*Stenostedion vitreum vitreum*)

The growth of the young of all species appears to be several weeks behind that of other years. This retardation is undoubtedly due to the cooler temperatures which have prevailed throughout most of June. Water temperatures increased only 3° F.; they averaged 68° F. in the western end of the lake and 71° F. in Sandusky Bay.



Spottail Shiner
(*Notropis hudsonius*)

Trawl catches of the larger fishes consisted mainly of yellow perch, and spot-tail and emerald shiners. The yellow perch, which had been congregated for spawning earlier this spring, have dispersed considerably to the greater depths. Many are still inshore, however, and feeding heavily on animal plankton and insect larvae. These fish are now putting on girth and weight and appear to be in very good condition.



Emerald Shiner
(*Notropis atherinoides*)

Commercial fishermen ceased operations almost entirely and fishing will not be resumed until the fall season. Several trap nets still remain in the lake and a few seines are being hauled; their catches, however, are generally small.

Note: Also see Commercial Fisheries Review, Aug. 1961 p. 29.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-JUNE 1961:

Landings of skipjack tuna (mostly 18-22 pound size) in Hawaii during June 1961 were about 2,750,000 pounds or only 50,000 pounds under the record for June which was established in 1954. The June 1961 landings of skipjack were caught by a fishing fleet about 25 percent smaller than in 1954. This indicates that the June 1961 landings per vessel were the highest on record.

A prediction was made in March this year by biologists of the U. S. Bureau of Commercial Fisheries that the skipjack landings in 1961 would be above average. However, the time of the annual change of surface sea temperature from cooling to warming in the vicinity of the Hawaiian Islands was such that using this as an index for predictive purposes was to extrapolate beyond the range of any of the historical data. Therefore, it was not known whether this season would be very good or whether fishing would shift beyond an optimum point and the season might actually turn out to be either poor or mediocre. Judging from the skipjack landings through June (about 5.7 million pounds), the prediction was reliable and summer conditions could be considered highly favorable for the occurrence of skipjack in Hawaiian waters.

Landings of skipjack tuna in Hawaii during May 1961 were estimated to be 1.1 million pounds or about 37 percent higher than the amount landed in the same month of 1960. The May landings of skipjack were also about 10 percent above the 1948-59 average for the month.

Total skipjack tuna landings for the first five months of this year amounted to 2.9 million pounds as compared with a 12-year average of 2.2 million pounds for the January-May period.



Industrial Products

WORLD PRODUCTION AS REPORTED BY PRINCIPAL PRODUCING COUNTRIES:

The International Association of Fish Meal Manufacturers has received and tabulated data on the production of fish meal, solubles, and oil as reported to them by 11 of the principal countries producing those products. The Association reports that on the basis of reports received from 10 of the 11 countries (Angola did not report) scheduled to report, the May 1961 production by those countries was: fish meal 193,325 short tons, solubles 10,811 tons, homogenized-condensed fish 1,353 tons, and oil 8,304,000 gallons. It is indicated that the oil data are incomplete.

The countries scheduled to report to the Association monthly are the United States, United Kingdom, Canada, Denmark, Germany, Angola, Iceland, Norway, Peru, South Africa, and France.

At the international meeting on fish meal in Rome early this year, it was agreed that it would be useful to have assembled by the Association monthly data on the production of fish meal, solubles, and oil in various countries. This is the first monthly report received by cable from the Association.



Maine Sardines

CANNED STOCKS, JULY 1, 1961:

Distributor's stocks of Maine sardines totaled 208,000 actual cases on July 1, 1961--36,000 cases more than the 172,000 cases on hand July 1, 1960. Stocks held by distributors on June 1, 1961, amounted to 215,000 cases, and on April 1, 1961, totaled 267,000 cases, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on July 1, 1961, totaled 201,000 standard cases (100 3 $\frac{3}{4}$ -oz. cans), a decrease of 158,000 cases (44.0 percent) as compared with July 1, 1960. Stocks held

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1961, With Comparisons^{1/}

Type	Unit	1960/61 Season					1959/60 Season				
		7/1/61	6/1/61	4/1/61	1/1/61	11/1/60	7/1/60	6/1/60	4/1/60	1/1/60	11/1/59
Distributors	1,000 actual cases	208	215	267	233	277	172	197	252	235	296
Canners . . .	1,000 std. cases ^{2/}	201	294	506	1,029	1,258	359	235	397	843	1,001

^{1/}Table represents marketing season from November 1-October 31.
^{2/}100 3 $\frac{3}{4}$ -oz. cans equal one standard case.

by cannery on June 1, 1961, totaled 294,000 cases and on April 1, 1961, amounted to 506,000 cases.

The 1961 season's pack as of July 22 amounted to only 152,000 standard cases as compared with 677,000 cases packed during the same period a year ago.

At the beginning of the 1961 packing season on April 1, the carryover was about 457,000 cases as compared to 335,000 cases a year earlier.

Note: See Commercial Fisheries Review, August 1961 p. 30.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SUMMER-AUTUMN 1961:

Total United States civilian consumption of fishery products is expected to be somewhat higher in the summer-fall of 1961 than in the same period last year. But with population higher this year, per capita use of these products will remain about the same. Retail prices of fish and shellfish probably will average a bit higher this summer-fall than a year earlier.

Commercial landings of food fish and shellfish in the summer are at a seasonally high level and total catch for the year probably will be as high as in 1960. Supplies of the processed items for 1961 likely will be about the same as last year. The minor variations probably will include less canned tuna and Maine sardines, but more canned salmon.

Imports were higher for the first four months this year than a year ago and probably will continue high through the remainder of 1961, especially for fillets and shrimp. Exports of edible fishery products in the summer-fall might be considerably lower than in 1960. Due to the small catch last season and reduced domestic supplies, exports of California sardines through April 1961 were down 62 percent from the same period last year.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fish-

eries, U. S. Department of the Interior, and published in the former agency's July 1961 issue of The National Food Situation (NFS-97).



Menhaden

PARASITES MAY REVEAL MIGRATORY PATTERNS:

Parasites which attach themselves to young menhaden may be used to determine where schools of adult fish originated, according to scientists at the Virginia Institute of Marine Science.

Although menhaden are spawned in ocean waters, the young come into bays and estu-



Menhaden

aries along the Atlantic and Gulf coasts where they grow to maturity. Juvenile menhaden usually pick up parasites in the estu-

arine waters. The Director of the Institute reports, "The types of parasites and the numbers picked up in the Chesapeake Bay, for instance, will often be different from those picked up in the rivers and bays of Maine or Florida. By examining large numbers of small fish, we have found that the parasites found on adults correspond closely to those found on one-year-olds. We strongly suspect that these parasites will serve as natural tags in tracing their migration."

Since the incubation areas of these important commercial fish can be pinned down, it may well be possible to compare numbers of fishes originating in polluted and unpolluted areas, and also to detect changes in commercial catches resulting from increased pollution in areas which once were clean.

Menhaden provide the largest fishery in the United States. More menhaden are landed in Virginia than all the rest of its marine resources combined, and in 1959 the catch was worth over \$4,250,000 to the State's fishermen and vessel owners.

Since menhaden meal is an important ingredient in poultry feed, the fishery is of great importance to farmers. Chickens fed a small percentage of fish meal reach market size in a shorter period of time than those denied this nutritious food. Menhaden

oil is often used in paints, varnishes, and cosmetics, and large quantities are exported to Europe for the manufacture of oleomargarine.

Virginia scientists have studied menhaden from Maine to Florida and along the coast of Mexico to identify types of parasites found on them and the abundance of each kind. This has been a cooperative enterprise between the U. S. Bureau of Commercial Fisheries and the Virginia Institute of Marine Science, with the Bureau supplying samples of fish from all along the coast and the Virginia scientists collecting, identifying, and counting the parasites.

The Bureau is particularly interested in using fish parasites for natural tags to determine migration of menhaden. As natural tags, they would eliminate handling of the fish, and the percentage of returns would be much better than from man-tagged fish.

The Virginia research assistant, who has been responsible for a great deal of the Virginia laboratory's phase of this work, reports: "We have made intensive studies of menhaden collected along the Atlantic coast from New York to the tip of Florida and around the Gulf coast. There are three species found on the Atlantic coast: Brevoortia tyrannus is the important commercial species of the Chesapeake Bay; below Cape Canaveral on the Florida coast, Brevoortia smithi, is the most abundant; and in the Gulf of Mexico Brevoortia patronus is the most important."

This study has been under way for two years and both Bureau and Virginia scientists feel the work accomplished is most encouraging in providing better information for the menhaden industry. Both agencies plan to increase the pace and to extend the area of this research.



Michigan

CHEMICAL CONTROL OF SEA LAMPREY IN NORTHERN STREAMS INITIATED:

Permission for the U. S. Bureau of Commercial Fisheries to continue its chemical war on the sea lamprey in 41 tributary streams in Lake Superior and northern Lakes Michigan and Huron during the July

1961-June 1962 fiscal year, has been granted by the Michigan Conservation Department.

All but seven of the streams flow into Lakes Huron and Michigan where the Bureau has shifted its offensive since last fall after completing the first series of treatment in Lake Superior streams.

The Bureau is currently working on blocks of northern Lake Michigan streams in Menominee, Delta, Schoolcraft, Mackinac, and Chippewa counties where it hopes to complete its first punch this summer. Plans call for linking its efforts closely with the Fisheries Research Board of Canada during the present fiscal year's campaign in Lake Huron streams.

The Bureau's Great Lakes Laboratory Director estimates it will take about 4 years to complete the first round of treatment in all lamprey-producing streams tributary to Lakes Michigan and Huron.

Hopes of breathing new life into the lake trout fishery of the Great Lakes are pinned to the lamprey control program. The next step, already started on a limited scale, is that of restocking the upper Great Lakes with yearling lake trout.

Heading up this immense control-restocking effort is the Great Lakes Fishery Commission which is made up of conservation officials from Ontario, the Federal government, and the Great Lakes States.



North Atlantic Fisheries Exploration and Gear Research

SURVEY OF MIDWATER FISHERY RESOURCES OFF NEW ENGLAND CONTINUED:

M/V "Delaware" Cruise 11: Over 1,000 linear miles of Gulf of Maine and Georges Bank waters were surveyed for concentrations of midwater fishes by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during a July 6-14, 1961, cruise. Utilizing fish-finding equipment, extensive portions of the Maine and Massachusetts coastal areas and parts of Georges Bank were examined to determine the availability of commercially-important

species. No midwater catches in commercial quantities were made during the cruise.

A midwater trawl was used on 10 occasions to sample indications of marine life revealed by the fish-locating equipment. These fish species were represented in the catches: spiny dogfish, *Squalus acanthias*; Atlantic herring, *Clupea harengus harengus*; silver hake, *Merluccius bilinearis*; lumpfish, *Cyclopterus lumpus*; longhorn sculpin, *Myoxocephalus octodecemspinosus*; butterfish, *Poronotus triacanthus*; Atlantic mackerel, *Scomber scombrus*; and alewife, *Alosa pseudoharengus*.



Hydrofoil otter board used to spread midwater trawl aboard M/V *Delaware*. These boards are fished in a vertical position and allow excellent control over the depth of the trawl, as indicated by a depth-sounder transducer mounted on the net.

Depth control of the midwater gear was accomplished by varying the vessel speed and the length of the towing warp. The response by the hydrofoil otter boards used to spread the net allowed fairly rapid changes in the depth of the net amounting to 10 fathoms or more.

In addition to the midwater sampling carried on, experiments using mercury-

vapor lamps for fish attraction were attempted at several locations; dip and gill nets were used to sample those fish attracted. Included in catches by these methods were hake (*Urophycis* sp.), Atlantic herring (*Clupea harengus*), sand eels (*Ammodytes americanus*), alewife (*Alosa pseudoharengus*), and Atlantic mackerel (*Scomber scombrus*).

Note: Also see *Commercial Fisheries Review*, Aug. 1961 p. 32 and April 1961 p. 26.



North Atlantic Fisheries Investigations

BOTTOM SEDIMENTS AND ORGANISMS COLLECTED FROM GULF OF MAINE:

M/V "*Delaware*" Cruises 61-9 and 61-10: Three-hundred-sixty samples of bottom sediments and organisms associated with the bottom were collected at regularly-spaced stations at 3-mile intervals on 8 east-west transects across the Gulf of Maine by the U. S. Bureau of Commercial Fisheries research vessel *Delaware* during two cruises that ended late in June 1961.

The samples will be analyzed in the Bureau's Woods Hole, Mass., Laboratory to determine the relation of the bottom organisms to the abundance and distribution of bottom-living fishes which subsist on animal life. Further studies will be made of the relation of bottom organisms to the sediment types in the Gulf of Maine and to the oceanographic conditions obtaining in the various parts of the Gulf.



North Pacific Exploratory Fishery Program

AREA OFF COAST OF OREGON SURVEYED FOR TRAWLABLE BOTTOM AND DEEP-WATER FAUNA:

M/V "*John N. Cobb*" Cruise 50: Objectives of an 8-week cruise (ended June 15) by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *John N. Cobb* were (1) to locate trawlable bottom in areas presently avoided by commercial trawlers, (2) to tag bottomfish found to inhabit such areas, and (3) to obtain information on marine fauna inhabiting very deep

waters off the Oregon coast. The deep-water explorations marked the start of a survey to be conducted off Oregon and Washington by the Bureau in conjunction with the U. S. Atomic Energy Commission. The Oregon Fish Commission cooperated with the Bureau in the cruise.



M/V "John N. Cobb" Cruise 50.

Regions included in the survey extended from Stonewall Bank off Newport, Ore., to the southern edge of Heceta Bank and an area located southwest of the mouth of the Columbia River.

Systematic surveys of the ocean bottom with a high-resolution, low-frequency echosounder resulted in the discovery of several trawlable areas of soft bottom within rocky regions avoided by commercial fishermen. The trawlable bottom included (1) a relatively large area of approximately 100 square miles at depths ranging from 75 to 200 fathoms located true west of Stonewall Bank, (2) a small area extending from about 90 to 200 fathoms located offshore between the Yaquina River and the Siuslaw River, and (3) an area of about 20 square miles located at depths between 58 and 66 fathoms about

20 miles off Heceta Head. Good catches of Dover sole, blackcod, and red rockfish were taken in the first area. The second area yielded excellent catches of Pacific ocean perch, red rockfish, Dover sole, and blackcod, including the largest catch ever made by the John N. Cobb--40,000 pounds of Pacific ocean perch obtained in 20 minutes of trawling. The grounds in the third area off Heceta Head produced poor catches of bottomfish with some damage to fishing gear resulting from the presence of large boulders. Damage to fishing gear also occurred in the first two areas from scattered outcroppings of coral.

Biologists from the Oregon Fish Commission tagged a total of 5,429 Dover sole, and 175 Pacific ocean perch during the cruise to provide information on the migratory habits and rate of growth of those commercially-important species.

Deep-water explorations included 16 trawl drags made at depths from 100 to 425 fathoms off the mouth of the Columbia River. Substantial catches of Dover sole and blackcod were taken in several of the drags. Unusual species encountered in the deeper waters included tanner crabs, brown sharks, grenadiers (a relative of the cod), deep-sea sole, and fanged viperfish.

COASTAL WATERS OFF OREGON AND WASHINGTON EXPLORED FOR ALBACORE TUNA:

M/V "John N. Cobb" Cruise 51: To obtain information on the abundance and distribution of albacore tuna and other pelagic



M/V "John N. Cobb" Cruise 51 (July-August 1961).

species of fish, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb departed Seattle on July 10, 1961, for a trip of 6 weeks of exploratory high seas fishing off Washington and Oregon. The coastal waters to 300 miles offshore of the two states are scheduled to be explored with gill nets, midwater trawls, and trolling. Information on albacore catches was scheduled to be broadcast to the fishing fleet by radio from the John N. Cobb.



Oceanography

GOVERNMENT-INDUSTRY SYMPOSIUM ON INSTRUMENTATION HELD IN WASHINGTON:

A Government-Industry Symposium on Oceanographic Instrumentation was held in the Department of the Interior Auditorium by the Interagency Committee on Oceanography on August 16-17, 1961.

One of the most serious problem areas in the National Oceanographic Program is that of instrumentation. Existing methods of data collection and processing must be radically improved. Consequently, the primary objective of the symposium is to focus attention in this critical area and to make known to representatives of United States industry the oceanographic instrumentation requirements which confront the Nation and which must be solved if the national objectives in the field of oceanography are to be fulfilled. The symposium was open to all companies interested in oceanographic instrumentation and data handling.

The instrumentation discussed during this symposium was unclassified and reflected the requirements of Federal and non-Federal activities and both military and nonmilitary applications. It included basic and applied research aspects as well as ocean surveys and will apply to under way and stopped shipborne operations and to individual instruments and instrument systems. The subject matter involved the following disciplines: physical and chemical oceanography, marine geology, geomagnetics, gravity, bathymetry, marine biology, radiobiology, meteorology, special fisheries investigations, and others.

The Interagency Committee on Oceanography is the organization established by the Federal Council for Science and Technology to coordinate the United States National Oceanographic Program currently being carried out by Federal agencies having an interest in oceanography. This Interagency Committee represents the Departments of Defense; Commerce; Interior, Health, Education and Welfare; State; Treasury; the Atomic Energy Commission; and the National Science Foundation.



Oregon

ALBACORE TUNA SCOUTING CRUISE ENDS SUCCESSFULLY:

A successful exploratory albacore tuna cruise by the Oregon Fish Commission's

chartered vessel Minnie B was completed on July 16. A Fish Commission biologist reported the best catches of albacore tuna were made from Cape Blanco north to Coos Bay, Ore., about 75 miles offshore, in waters with a 62° F. surface temperature.

The 15 albacore that were tagged and released were caught by trolling a commercial-type feathered jig. The surface water temperatures encountered during the cruise were between 62° and 64° F., generally high for this time of year and up to two degrees higher than during a similar 1960 cruise.

The biologist also reported that although no commercial tuna vessels were sighted on the albacore grounds during the cruise, some boats were leaving Astoria and Newport on July 15 and 16. One boat out of Astoria reported a catch of three tuna made on July 15 about 40 miles southwest of the Columbia River mouth.

The July cruise marked the third consecutive year the Fish Commission has undertaken surveys to help predict the presence of albacore tuna off the Oregon Coast by correlating biological and environmental conditions to the presence or absence of tuna, and to gather data by tagging methods on the migration and distribution habits of the tuna.

* * * * *

FISH COMMISSION OBSERVER REPORTS NO FISH KILLS IN OFFSHORE SEISMIC OPERATION:

No fish kills were observed during the initial oil exploration operations off the Oregon coast, the Fish Commission of Oregon observer aboard the Shell Oil Company's seismic vessel Miss Betty reported late in June 1961. The observer, assigned jointly by the Fish Commission and the Oregon Game Commission to observe all seismic oil exploratory work being conducted off the Oregon coast by Shell Oil Company, was accompanied on the first cruise on June 21 by two fishery agents of the Oregon Game Commission.

Originally planned as a three-day cruise, the operation was limited to one day because of damage sustained by the Miss Betty in heavy seas as the vessel was heading north from California to begin work off Oregon.

Working out of Coos Bay, two Shell Oil vessels were involved in the first

cruise--the Miss Betty handling the explosive charges and the Miss Juanita carrying seismic instruments.

The observers stated that each shot site was observed but no dead fish were sighted. The absence of concentrations of sea birds that would normally soon assemble over any fish kill gave additional evidence that the explosions had not had adverse effects on fish that may have been in the area.

Electronic devices capable of detecting the presence of schools of fish are operated on the explosives vessel as a precaution against detonating a charge in close proximity to fish concentrations where considerable damage could conceivably result.

Every precaution to assure the safeguarding of the State's offshore fishery is being taken, the Commission Director stated. The assignment of a full-time observer by the Commission during all seismic operations is an additional precaution to assure that potential fishery damage is prevented. The observer, acting on and in behalf of the State Fish Commission and the State Game Commission, has the authority to stop operations in any given area if, in his opinion, undue damage to marine life or wildlife will occur, or has occurred, or to stop temporarily or slow up operations until the observer can clearly determine the amount of actual or potential biological damage.

MCKENZIE RIVER SALMON SPAWNING CHANNEL AGREEMENT REACHED:

Regarding the operation and evaluation of an artificial spawning channel for spring chinook salmon on the McKenzie River, the Oregon Fish Commission and the Eugene Water and Electric Board have entered into a formal agreement, the Commission Director announced late in June 1961. The spawning channel was designed to offset some of the losses of natural spawning grounds occasioned by the construction of the Eugene Board's Carmen-Smith hydroelectric project on the McKenzie about 70 miles above Eugene. The installation is the first of its kind in Oregon for spring chinook salmon. Although the McKenzie River and its tributaries produce between 45 and 50 percent of the Willamette River system's highly important spring chinook run, no fish passage facilities have been provided at Carmen-Smith due to

its location above the major spawning area of the McKenzie system with, consequently, relatively few anadromous fish involved.

The artificial spawning facility's design was determined by attempting to duplicate optimum natural spawning conditions. It consists of a channel 500 feet long by 30 feet wide (the channel bottom of which is covered with graded gravel), a holding pond for adult salmon, a controlled-flow water supply, trap and weirs, and a main stream velocity barrier to divert the fish into the facility. One hundred or more spring chinook females can be accommodated by the present channel, Schoning stated.

A Commission biologist has been assigned to conduct the operation of the channel and to evaluate the results of the experiment. Similar operations, notably in British Columbia and in California, have given indications that the spawning channel may become an important tool in management of anadromous fish runs in Western rivers, where an ever-increasing number of dams create barriers to free passage of anadromous species.

The Eugene Water and Electric Board is financing the study, initially scheduled for a period of three years.



Oysters.

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING:

Systematic observations in Long Island Sound on spawning and setting of oysters and starfish, using the same 10 major stations as in previous years were planned for this summer by the Milford, Conn., Biological Laboratory of the U. S. Bureau of Commercial Fisheries. However, several others were to be established, chiefly in connection with studies on chemical methods of control of shellfish predators.

In addition to information on setting, the Laboratory plans to report on all other important biological phenomena that may be observed. Industry and shellfish biologists, as in the past, were to be informed of progress in the development of methods of chemical control of shellfish enemies.

Spawning of oysters as of July 7, 1961, had begun in the shallow tributaries of Long

Island Sound, but the predominating majority as of that date were still unspawned and many unripe. Setting of starfish had also begun. (Bulletin No. 1, July 7, 1961.)

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF JULY 26:

Several stations, in addition to the basic ten, were established in New Haven Harbor for observations on spawning and setting of oysters and starfish during the summer by the Milford, Conn., Biological Laboratory of the U. S. Bureau of Commercial Fisheries. These stations were to be used in connection with studies of chemical methods of controlling shellfish enemies.

Later, it became necessary to establish several other stations--another in New Haven Harbor and 3 in the Bridgeport area. The last three, established upon the request of the State Shell Fish Commission, were located in the area where the Bridgeport Harbor channel is to be dredged. These stations were to be used in connection with observations on turbidity and sedimentation created, by dredging, upon larval, juvenile, and adult mollusks.

The water temperature at all of the stations showed a considerable increase, and on July 24, when the last series of spat collectors was brought in, the temperature ranged from approximately 65°-73° F.

Studies of oysters showed that the majority of them were in a partially spawned condition, as was to be expected during this part of the reproductive season. Some, however, were virtually spawned out, while another small group was composed of individuals that were not quite ripe.

Studies of plankton samples were carried on as a matter of routine to determine whether larvae of oysters and other bivalves were present in the water. Early in July bivalve larvae, especially young ones, were numerous. By July 10 there were almost no early stage larvae at any of the stations, but a fair number of late stage larvae, although none of oysters, were found. By July 13 these larvae had almost completely disappeared in the Milford and New Haven areas, while at Bridgeport a fair number of mussel larvae was still found.

Plankton samples collected two days previously again showed a scarcity of bivalve larvae at all stations. This phenomenon was ascribed to a heavy bloom of dinoflagellates (microscopic forms causing "red water"), primarily *Prorocentrum micans*, and a species of *Gymnodinium*, waste products of which probably affect molluscan larvae in nature and also render sea water temporarily unfit for the laboratory work on fertilization of oyster and clam eggs and growing of larvae. These conditions, however, improve later in the season.

Setting of starfish continued and occurred at all of the basic 10 stations, except at one station. One station located at a depth of 24 feet in the Bridgeport area showed the heaviest set.

The first oyster spat was found at a station in New Haven Harbor in an area where studies of the methods of controlling oyster enemies were being conducted. It set on July 21. This observation indicates that the Laboratory's formula offered many years ago stating that, "The beginning of oyster setting in Long Island Sound should be usually expected on July 19 ± 4 days, regardless of lunar phases and of changes in hydrostatic pressure caused by changes in tidal level," still holds true in the majority of cases. (Bulletin No. 2, July 26, 1961.)



Pollution

CONTRACT AWARDED FOR DAM TO STOP POLLUTION IN UPPER SACRAMENTO RIVER VALLEY:

A long-standing water pollution problem which has taken a heavy toll of salmon, steelhead trout, and rainbow trout in the upper Sacramento River Valley is being corrected, the Under Secretary of the Interior announced on June 30, 1961. The problem originates with drainage water principally from abandoned mines in the Spring Creek area above Redding, Calif., bringing metal and acid pollutants into Keswick Reservoir and the Sacramento River.

The solution proposed by the Department of the Interior is a 190-foot-high earthfill dam, now under contract for

\$3,196,387, which will permit water regulation to dilute the pollutants, and which at the same time will prevent debris from obstructing the tailrace of the Spring Creek Power Plant, which is now under construction. Both are being built by the Department's Bureau of Reclamation as part of the Central Valley Project.

According to the Commissioner of Fish and Wildlife, studies made by the U. S. Fish and Wildlife Service show that the fall run of chinook salmon in the Sacramento River about the mouth of the Feather River provide an annual catch of 700,000 fish, worth about \$5,900,000 to commercial and sport fishermen. About one-fourth of this fishery, with an annual value of \$1,400,000, comes from the four-mile stretch of the river adversely affected by the pollutants.

Historically, high Spring Creek flows frequently coincided with flood flows of the Sacramento River and the toxic water was diluted sufficiently to be tolerable to fish, primarily salmon. However, since flood control on the upper Sacramento was achieved by the construction of the Shasta Dam, the highly polluted Spring Creek flows have entered the Sacramento River at controlled flow periods. As a result, the waters below Keswick Dam, where the migrating fish are concentrated, have been toxic enough at times to kill large numbers of salmon and steelhead.

The Service studies also showed that not only did the mine-waste pollution kill salmon and damage their food supply but that it also ruined an important rainbow trout fishery in the Spring Creek area of the Keswick Reservoir.

Facing the dual problem of pollutants seriously damaging the important fishery, and silt and debris threatening the tailrace of the new Spring Creek powerplant, the Bureau of Reclamation designed the Spring Creek debris dam to provide storage space for 2,000 acre-feet of sediment each year for the next 50 years. In addition the dam will provide for the retention of the polluted water so that it can be slowly released and diluted to provide protection to the fish and the organisms upon which they feed.

The Spring Creek Dam embankment will be 1,200 feet long at the crest. The contract includes construction of the dam, concrete

spillway and outlet works, and excavation of the powerplant tailrace. The powerplant tailrace must be complete for use by June 1, 1963, when the first generator of the 150,000-kw. Spring Creek Powerplant will be tested, prior to going into operation about July 1, 1963. The powerplant is six miles northwest of Redding and the debris dam will be a short distance upstream. The powerplant and dam are part of the Trinity River Division of the Central Valley Project.

* * * * *

INDUSTRIAL WASTES ACCOUNT FOR MOST FISH KILLS:

More fish are reported killed by industrial wastes than by other pollutants, according to a report of the U. S. Public Health Service's Division of Water Supply and Pollution Control. Figures contained in the first annual summary report of the cooperative Federal-State fish-kill project showed that in the first seven months, June through December 1960, a total of 286 reports was received from 36 states showing a total of 6.3 million fish killed.

Agricultural poisons accounted for the second highest number of fish-kill reports, though they were in fifth place in total number of fish killed.

The total river mileage affected was 1,153 miles, in addition to 51 miles of lake and bay shore lines, and 1,407 acres of lakes, reservoirs, and bays.

Of the 305 reports on source of kills (many reported more than one source), industrial wastes were reported in 98 instances, with a total of 5,460,000 fish killed; agricultural poisons were reported in 81 instances, with a total of 73,000 fish killed; unknown sources were reported 51 times with a total of 190,000 fish killed; "other" sources were listed in 38 reports with a total of 38,000 fish killed; domestic sewage was fifth with 27 reports, with 287,000 fish killed; and mining operations were reported 10 times with a total of 250,000 fish killed.

One kill traced to industrial wastes was estimated at 5 million fish. This was in 19 miles of the Kanawha River for about two days late in August 1960, caused by a spill of methyl alcohol. Even after subtracting this figure, the number of fish killed by industrial wastes is nearly double the next named source of total number of fish kills, domestic wastes.



Russian Gill-Netter Docks in Boston, Mass.

As a result of a medical emergency on board the Soviet fishing vessel *Kanhnhlpaa* (CPT 184), it docked in Boston harbor during June 1961. The vessel, a gill netter, was one of a fleet of vessels which had been working in the western North Atlantic between the Grand Banks of Newfoundland and Georges

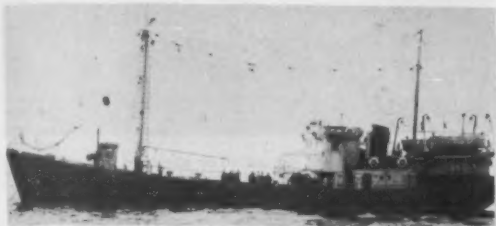


Fig. 1 - The *Kanhnhlpaa*, a combination-type vessel, approximately 145 feet long. This type of vessel is normally active in the herring fishery off Northern Europe and is capable of drift gill-net fishing and/or trawling. Other than a trawling winch, there was no trawl gear aboard the vessel during its visit to Boston. The vessel ordinarily fishes with a mothership. The vessel salts its catch in barrels, which are later transferred to a mothership. There is adequate fuel aboard for a trip of about 30 days.



Fig. 2 - View of the pilothouse aboard the Soviet gill-netter.

Bank off the Massachusetts coast. With the permission of the Soviet Embassy, several members of the U. S. Bureau of Commercial Fisheries Gloucester Exploratory Fishing and Gear Research Base were permitted on board to see the vessel and its gear.

The *Kanhnhlpaa* had been away from her home port of Kaliningrad on the Baltic Sea since early April of this year; however, the vessel's officers expected that they would return to European waters soon after their departure from Boston.

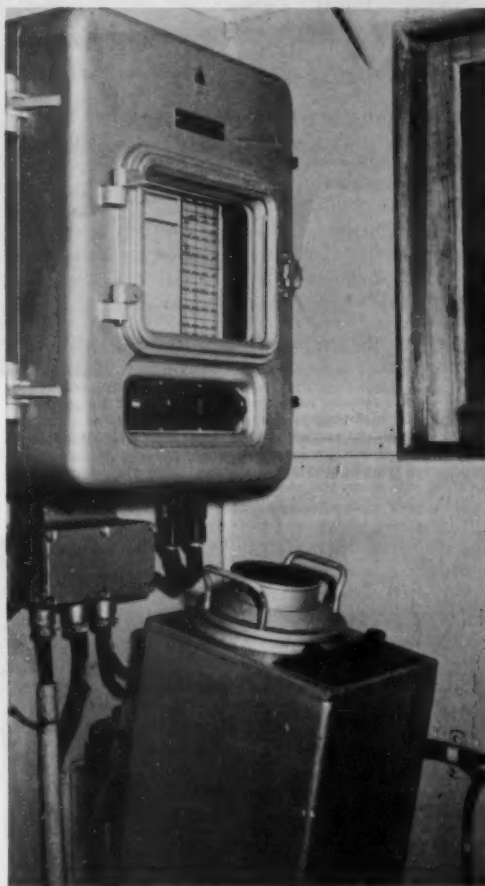


Fig. 3 - Depth-sounding equipment mounted in the pilothouse; note the "fishscope" under the recorder.



Fig. 4 - Depth-sounder recording being examined aboard the gill-netter. The recording gear is utilized principally as an orientation instrument, according to a vessel officer. Although occasional fish traces are apparent, the depth-sounder is not ordinarily used specifically for fish-finding. No other type of fish-locating equipment was observed.



Fig. 5 - Portion of gill net piled under tarpaulin on port side of fore-deck. Nets observed were of a nylon-type synthetic. Mesh sizes in use varied from 24 to 32 mm. or 0.9-1.3 inches (bar measurement). When fishing, 50 to 70 joined sections of net are set out from the port side. These sets are made in a straight line and when completed cover up to 3 km. (approximately 2 miles).



Fig. 6 - Footrope of gill net coiled on starboard side of vessel. The heavy footrope provides the weight to sink the nets. It is suspended from the gill net by rings similar to those on a purse seine.

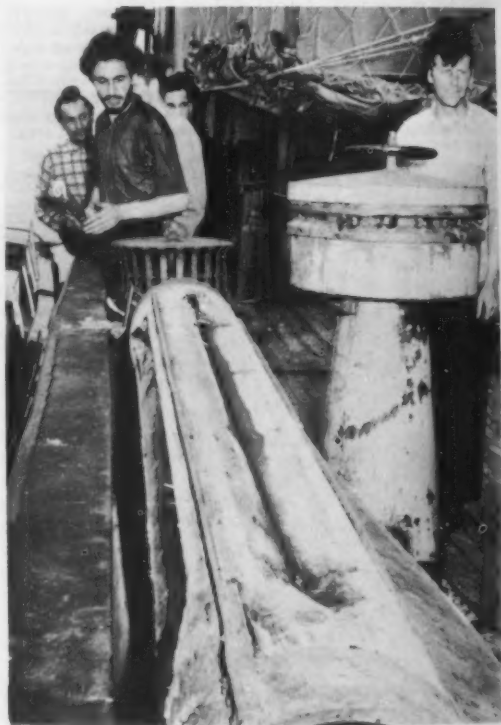


Fig. 7 - Crew members near the roller and net hauler on the starboard rail of the vessel. There were 23 in the crew of the vessel when it arrived in Boston.



Fig. 8 - Fairlead and capstan used to haul the footrope aboard. This gear is mounted near the vessel's bow on the starboard side.



Fig. 9 - Close-up of net-hauling device in use aboard the *Kanhn-hipa*. This equipment is generally similar to hauling devices used by gill-net fishermen in New England, although it is of heavier construction.



Fig. 10 - Visitors with crew members (in background) examining a float from which the gill nets are suspended. The corkline of the nets is usually fished from $\frac{1}{2}$ to 5 fathoms below the surface.

--By Warren F. Rathjen and Peter C. Wilson,
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Salmon

MORTALITY STUDIES OF SILVER SALMON HOOKED AND RELEASED BY TROLLERS:

Determination of the mortality of silver salmon hooked, landed, and released during normal commercial trolling activities in Oregon offshore waters was the primary objective of a recently completed 18-day salmon troll cruise by Oregon Fish Commission biologists aboard the chartered vessel *Barracuda*, the Commission announced on June 30.

The question of hooking mortality is of primary concern in the management of the State's salmon resource since, during actual commercial trolling operations, minimum-size requirements and a difference in open-fishing season periods on chinook and silver salmon result in the release of many salmon hooked and boated on the offshore trolling grounds.



Present regulations specify that commercially-taken chinook must measure at least 26 inches in length. Although there is no minimum-size requirement on silver salmon, the season on this species does not open until June 15, two months after the chinook season opens. The difference in season is based upon the biology of the silver which shows phenomenal growth during the final year of its two-year ocean sojourn, making the delayed opening economically sound as well as representing good management of the resource.

More than 1,200 salmon, predominantly silvers, were tagged and released during the 12 full days and 2 partial days of actual fishing time during the cruise. Regulation commercial gear, including various types of spoons and wobblers equipped with the usual barbed hooks, was used during the scientific investigation. An area 20 miles in length between the mouth of the Columbia River southward to the vicinity of Cannon Beach was fished.

In addition to the observed mortality experienced while actually hooking and boating the salmon during the initial phases of the operation, returns of tagged fish from both the commercial and sports catch will yield information on delayed mortality from injuries not readily apparent at the time of tagging and release. As a bonus, the fisheries specialists expect to gain more information concerning fishing intensities on silver and chinook salmon stocks as well as gathering supplemental biological data on migratory habits and distribution. Such information is vital in determining proper open and closed seasons and size limitations

in keeping with the best possible management of this important resource.

Both commercial and sports fishermen are urged to report the taking of tagged salmon to the Fish Commission Research Laboratory, Astoria, or to the Fish Commission of Oregon, Portland 1, Oregon.



Sea Scallops

ECONOMIC STUDY OF ATLANTIC COAST FISHING INDUSTRY STARTED:

A comprehensive economic study of domestic sea scallop production has been started by the U. S. Bureau of Commercial Fisheries, it was announced on June 27, 1961. The objectives of the study are to examine economic trends in the New England sea scallop fishing industry and to determine the competitive position of the domestic fleet in relation to foreign-based vessels.



Typical scalloper operating out of New Bedford, Mass.

In the decade 1951-1960, sea scallop imports have risen from about 750,000 pounds annually to 6,800,000 pounds. Canada exported about 6.3 million pounds to the United States in 1960 as compared to United States production of 26.6 million pounds. The share of the domestic market supplied by foreign shippers has been steadily rising in recent years.

The reason for the study is the economic distress in which the sea scallop fishing industry centered at New Bedford, Mass., now finds itself. Prices for sea scallops at that port have declined drastically and fishermen's earnings have been severely affected.

The study is being made by Boston College under a \$16,750 contract awarded by the U.S.

Bureau of Commercial Fisheries. It will be financed with funds made available by the Saltonstall-Kennedy Act of 1956, which has as its objective the betterment of the domestic fisheries. The study is to be completed by June 30, 1962.



Shrimp

FREEZE-DRIED PRODUCT ON THE MARKET FOR INSTITUTIONAL USE:

Now freeze-drying, a new preservation process, is being used to preserve shrimp. Freeze-dried shrimp sell for about the same price as green frozen shrimp.

This new product is being produced by a large United States importing firm through a food processing subsidiary at San Carlos, Tex.

Shrimp, frozen or fresh, are cooked and cleaned, quick frozen, and dehydrated at such high vacuum that ice crystals do not melt to deform the tissues, nor does surface-skinning occur. The freeze-dehydrated shrimp after rehydration return to a fresh-like state.

They are shipped in 3-quart cans, evacuated, and refilled with an inert gas. They can be transported and stored without further refrigeration until ready to serve. Once packed in the can, shrimp need no refrigeration until the container is opened. Then to reconstitute the shrimp, they are placed in lukewarm water for 15 minutes, which restores them to their original appearance and freshness. The 3-quart can yields $3\frac{1}{2}$ pounds of shrimp with all its natural appearance, flavor, and texture restored.

At present only institutional users are being served from the San Carlos plant which handles several tons a day.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1961:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1961.

Oyster Studies: As a cooperative program, the Laboratories and the State's Division of Commercial Fisheries set aside seed oyster beds in the spring and early summer of 1960. From these seed beds commercial oystermen harvested and transplanted 3,168 bushels of young oysters to other leased grounds within the State. This operation was successful. During the period covered by this report such transplantings were expanded and this time 36,562 bushels of seed were distributed on leased grounds. Detailed inspections of some of the plantings indicate that less than a 10-percent mortality took place. In general this program, which in the past years has not been followed in South Carolina, appears practical, provided the seed are moved to areas comparable in hydrographic conditions.

Personnel from the Laboratories also assisted in establishing and cultivating oyster parks where the general public can gather oysters for private use. Two dozen of these public areas have now been set up; some in each of the coastal counties.

Also during the quarter, tests were run on the value of a lightweight aggregate to determine if it could be used as a substitute for shell cultch. Paired wire bags of shell and rock were exposed in a good setting area. Setting began during the fourth week of May. By the first week in June setting on steamed shell cultch had reached an intensity of 15 to 16 spat per square inch. On the rock aggregate, setting was extremely light. However, by late June setting on the substitute cultch began to improve. The tests will be continued through July before appraisal of the substitute cultch is made.

An examination of seed oysters moved in October 1959 from a high salinity, intertidal area to a low salinity, deep-water area showed that most of the few oysters now there are from a natural set. None was found over 2 inches from hinge to bill and more than 50 percent of those gathered were less than 1 inch. On February 10, 1960, four covered wire trays containing high-salinity intertidal seed were placed on the deep-water beds. Three of the four trays were silted over when recovered on June 28, 1961. The fourth tray contained a dozen live oysters: five in the 1 to 2 inch class; 6 in the 2 to 4 inch group; and 1 was $3\frac{1}{2}$ inches. All were in poor condition and showed no new growth.

This experimental planting confirms the belief that very careful attention must be

paid to transplanting of oysters in South Carolina waters, particularly to environmental conditions. Transplanting to subtidal beds certainly needs further study.

Shrimp Studies: Both white and brown shrimp declined in abundance in experimental trawls during the second quarter of 1961. Brown shrimp were about 5 times less numerous, and white shrimp showed a drop of over $2\frac{1}{2}$ times during the quarter as compared with the same quarter of 1960. The decrease in numbers of white shrimp to date, however, is by no means an indication of a poor fall season since spawning is still continuing.

Postlarval brown shrimp were scarce in experimental plankton tows this year. Although these postlarval shrimp continued to recruit for a longer period this year, their numbers did not approach those of 1960. White shrimp postlarvae began to appear in plankton tows in late May and continued to increase in abundance throughout June. These postlarvae should reach maximum abundance in inshore waters during the first few weeks of the third quarter of 1961. Then it should be possible to make some predictions as to the expected abundance of adult shrimp for the fall of 1961.

Fish: Shrimp survey catch data for the April-June quarter this year revealed that small spot were seven times as abundant in experimental trawl hauls as compared with those made during the same period in 1960. These findings lend support to the earlier predictions that 1961 should be a very successful year for this species.

The number of croakers have increased somewhat since the early part of this year, but still continue to be considerably less abundant than they were at this time in 1960. The decline amounts to about 30 percent.

Pond Cultivation: Three experimental shrimp ponds were drained and harvested during the quarter. Two of these were one-acre ponds and the other was a small one-tenth acre pond which had been stocked by means of a 4-inch fish pump. The one-acre ponds had been drained on December 16, 1960, screened off with one-quarter inch wire mesh and treated with "Chem-Fish" to kill the remaining fish. These ponds were then allowed to stock naturally by flooding from the nearby creek.

The harvest from the one-tenth acre pond was very small. Only six brown shrimp were collected. This experiment was not considered to be a valid test of the effectiveness of the fish pump in stocking shrimp ponds since postlarval brown shrimp were very scarce this year. The experiment will be repeated during the time that white shrimp postlarvae are abundant.

One of the one-acre ponds which had very little interchange of water with the creek, contained only $2\frac{1}{2}$ pounds of 31-35 count brown shrimp, 52 pounds of fish (chiefly spot), and 11 pounds of blue crabs.

The other acre pond, which had been allowed to flood and partially drain on every tide from early March until May, contained a considerably greater amount of shrimp and fish. This pond yielded approximately 9 pounds of brown shrimp, 150 pounds of fish, and 7 pounds of blue crabs. The majority of the fish were small spot which had entered the pond as larvae earlier in the year. The total number of fish collected from the pond was about 15,000; of which 13,000 were spot.

Installation of an eight inch irrigation pump, to be used in pond stocking of postlarval shrimp, got under way during the quarter. This pump will move large volumes of water from the creek which runs near the Laboratories into a one-acre experimental shrimp pond. This experiment is to determine if postlarval shrimp can be pumped into a pond in sufficient quantities to give an adequate yield. This will give actual experimental data to answer the numerous letters of request on shrimp farming from those areas which, unlike South Carolina, do not have sufficient rise and fall of tide to stock the ponds.

Note: See Commercial Fisheries Review, June 1961 p. 39.



Tuna

RESEARCH DISCUSSED AT HONOLULU MEETING:

An informal Pacific Tuna Biology Conference was held August 14-19, 1961, at Honolulu, Hawaii, bringing together scientists from 17 organizations in six countries to discuss the results of their research on tuna.

The Conference was sponsored by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, and the participants represented organizations in Canada, French Oceania, Hong Kong, Italy, Japan, and the United States.

The Conference was organized into six sections to consider the following aspects of tuna biology: (1) distribution, (2) migrations, (3) subpopulations, (4) behavior, (5) tuna oceanography, and (6) taxonomy and nomenclature. More than 40 papers on those subjects were distributed to the participants for discussion at the meeting.

The Conference immediately preceded the 10th Pacific Science Congress, which was held in Honolulu August 21-September 6, 1961, with an attendance of over 1,000 scientists from all over the world.

Three fishery research vessels were in Honolulu during the Tuna Biology Conference and were open for visits--the Shoyo Maru, of the Tokyo University of Fisheries; the Makua, operated by the Hawaii State Division of Fish and Game; and the Charles H. Gilbert, operated by the Bureau's Biological Laboratory, Honolulu.



U. S. Fishery Landings, January-June 1961

Total Catch: Data primarily for the first six months of 1961 indicate that this year's United States commercial fishery landings are about 241 million pounds ahead of the first six months last year.



Fig. 1 - In foreground are two of the more common types of boats used to catch blue crabs in Chesapeake Bay area. Usually manned by one man and powered by an outboard motor.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1961 and 1960				
Species	Period	1961 ^{1/}	1960	Total 1960
..... (1,000 Lbs.)				
Anchovies, Calif.,	6 mos.	2,100	1,610	5,057
Cod:				
Maine	5 mos.	1,100	1,568	2,897
Boston 2/.....	6 "	11,200	8,407	15,548
Gloucester 2/..	6 "	1,400	1,874	3,199
Total cod		13,700	11,849	21,644
Haddock:				
Maine	5 mos.	1,100	1,530	3,834
Boston 2/.....	6 "	45,400	38,633	76,695
Gloucester 2/..	6 "	8,200	8,795	12,107
Total haddock		54,700	48,958	92,636
Halibut: 3/				
Alaska	6 mos.	12,500	14,283	21,351
Wash. & Oreg...	6 "	8,700	10,614	16,802
Total halibut		21,200	24,897	38,153
Herring:				
Maine	5 mos.	40	1,966	152,327
Alaska	6 "	15,200	19,000	78,700
Industrial Fish, Maine & Mass. 4/	6 mos.	11,200	14,800	43,733
Mackerel:				
Jack	6 mos.	25,900	37,996	74,945
Pacific	6 "	17,300	9,232	36,808
Menhaden	6 mos.	768,100	541,232	1,999,000
Ocean Perch:				
Maine	5 mos.	33,700	26,934	78,258
Boston	6 "	300	430	1,481
Gloucester ...	6 "	29,300	31,981	61,673
Total ocean perch		63,300	59,345	141,412
Salmon:				
Alaska	to July 27	137,000	133,000	213,000
Washington ...	5 mos.	2/1,000	2/832	16,178
Oregon	3 "	2/100	2/68	5,582
Scallops, Sea, New Bedford (meats)	6 mos.	9,700	8,927	19,353
Shrimp (heads-on):				
South Atl. & Gulf.	6 mos.	52,300	61,781	236,938
Washington ...	5 "	300	559	1,801
Oregon	3 "	70	14	881
Squid, Calif.	6 mos.	900	290	2,562
Tuna, Calif.	to July 15	178,000	161,860	283,060
Whiting:				
Maine	5 mos.	-	393	11,123
Boston	6 "	40	60	754
Gloucester ...	to July 23	16,000	27,199	63,112
Total whiting		16,040	27,652	74,989
Total all above items		1,388,150	1,165,868	3,538,759
Others not listed		304,250	285,110	1,391,241
Grand Total		1,692,400	1,450,978	4,930,000
1/Preliminary. 3/Dressed weight.				
2/Landed weight. 4/Excludes menhaden.				
Note: Data represent weight of fish and shellfish as landed except for mollusks which are reported on weights of meats only.				

Menhaden: During the first 6 months of 1961, landings totaled about 768 million pounds--up 227 million pounds as compared with the same period in 1960.



Fig. 2 - Menhaden vessel docked at a fishery industrial products plant in Empire, La.

Tuna: Landings in California, including transshipments of United States-caught fish from South America, totaled 178 million pounds to July 15--a gain of 16 million pounds as compared with 1960. The purse-seine catch was up 39 million pounds while landings by the clipper fleet were down nearly 30 million pounds.

Salmon: On the basis of the reported pack of canned salmon, it is estimated that the Alaska catch to July 27 totaled about 137 million pounds--4 million pounds more than to the same date in 1960.



Fig. 3 - Medium shrimp trawler docked at Westwego, La.

Haddock: New England landings--about 55 million pounds during the first six months of 1961--were nearly 6 million pounds greater than in the same period in 1960.

Ocean Perch: Landings at Maine ports during the first five months of the year and at Gloucester through June totaled over 63 million pounds--4 million pounds more than in the same period in 1960.

Mackerel: Landings of jack mackerel (25.9 million pounds) during the first six months of 1961 were only 68 percent as large as in 1960, while those of Pacific mackerel (17.3 million pounds) were nearly twice those for the same period last year.

Whiting: Landings at Gloucester through July 23 totaled 16 million pounds--substantially less than the 1960 landings for that period.

Shrimp: Landings in the South Atlantic and Gulf States during the first 6 months of 1961 amounted to 52.3 million pounds--somewhat less than in 1960.

Scallops: New Bedford landings through June totaled 9.7 million pounds--nearly 800,000 pounds more than in 1960. Total 1960 landings of scallops were the largest in history.



U. S. Fishing Vessels

DOCUMENTS ISSUED AND CANCELLED, MAY 1961:

During May 1961, 63 vessels of 5 net tons and over were issued first documents as fishing craft, 2 vessels less than in the same

Table 1 - U. S. Fishing Vessels ^{1/} -Documents Issued and Cancelled, by Tonnage Groups, May 1961		
Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
 (Number)	
5-9	29	12
10-19	8	8
20-29	4	3
30-39	3	-
40-49	2	-
50-59	5	-
60-69	4	1
70-79	3	-
240-249	1	-
290-299	1	-
360-369	1	-
540-549	1	-
770-779	1	-
Total	63	24
^{1/} Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net-tons and over.		
^{2/} Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft reported in the May 1961 supplement were built: 46 in 1961, 2 in 1960, and 15 prior to 1945. Assigned to various sections on the basis of their home ports.		
^{3/} Includes vessels reported lost, abandoned, forfeited, sold alien, etc.		
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.		

Table 2 - U. S. Fishing Vessels^{1/-}-Documentations Issued and Cancelled, by Areas, May 1961 with Comparisons

Area (Home port)	May		Jan.-May		Total 1960
	1961	1960	1961	1960	
.....(Number).....					
<u>Issued first documents 2/</u>					
New England	4	1	15	7	35
Middle Atlantic	1	4	2	10	16
Chesapeake	4	10	25	23	78
South Atlantic	3	5	15	22	48
Gulf	18	11	52	29	89
Pacific	32	33	70	68	147
Great Lakes	1	1	5	4	18
Puerto Rico	-	-	2	-	-
Total	63	65	186	163	431
<u>Removed from documentation 3/</u>					
New England	1	2	6	8	22
Middle Atlantic	3	-	15	4	18
Chesapeake	2	2	17	9	21
South Atlantic	3	3	11	18	38
Gulf	5	8	44	46	88
Pacific	10	4	43	32	86
Great Lakes	-	1	8	5	13
Puerto Rico	-	-	-	1	1
Total	24	20	144	123	287
See footnotes in table 1.					

See footnotes in table 1.

month last year. But the number issued first documents the first 5 months this year was 23 more than in the same period last year.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MAY 1961:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during May 1961 increased by 18.9 percent in quantity and 24.4 percent in value as compared with April 1961. The increase was due partially to higher imports of fillets other than groundfish (up 1.3 million pounds), frozen other tuna (up 2.1 million pounds), and lobster and spiny lobster (up 2.9 million pounds). The increase was partly offset by a 0.9-million-pound decrease in the imports of shrimp and frozen albacore tuna (down 0.7 million pounds).

Compared with May 1960, the imports this May were up by 2.1 percent in quantity and 0.4 percent in value due to higher imports of groundfish fillets (up 4.9 million pounds). Compensating, in part, for the increase was a drop of about 3.8 million pounds in the imports of frozen tuna other than albacore.

United States exports of processed fish and shellfish in May 1961 were lower by 16.3 percent in quantity and 45.5 percent in value as compared with April 1961.

U. S. Imports and Exports of Edible Fishery Products, May 1961 with Comparisons

Item	QUANTITY			VALUE		
	May		Year	May		Year
	1961	1960	1960	1961	1960	1960
	(Millions of Lbs.)			(Millions of \$)		
<u>Imports:</u>						
Fish & shellfish:						
Fresh, frozen, & processed 1/	83.4	81.7	1,011.2	26.0	25.9	304.8
<u>Exports:</u>						
Fish & shellfish:						
Processed only 1/ (excluding fresh & frozen)	1.4	1.8	48.7	0.6	0.6	19.2

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

Compared with the same month in 1960, the exports this May were down by 20.0 percent in quantity and unchanged in value. The drop in exports in May this year as compared with the same month in 1960 were due primarily to very low stocks of California sardines and Pacific salmon available for export to foreign markets.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

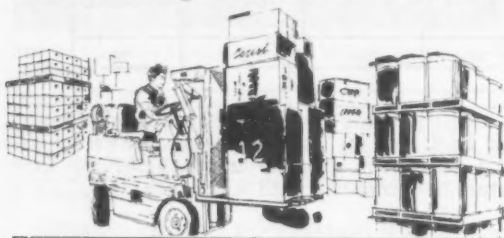
The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1961 at the $12\frac{1}{2}$ -percent rate of duty is 57,114,714 pounds. Any imports in excess of the quota are dutiable at 25 percent ad valorem.

Imports from January 1-June 30, 1961, amounted to 23,575,216 pounds, according to data compiled by the Bureau of Customs.

Imports in 1960 for the period January 1-July 2 amounted to 22,698,066 pounds.

WORLD TRADE IN UNITED STATES FISHERY PRODUCTS, 1960:

In 1960, the United States exported a total of \$44,165,000 of fishery products to 105 countries throughout the world. This was a



slight decrease from 1959 when exports of fishery products were valued at \$44,241,000. In 1959 the export value of U.S. fishery products was the highest since the record year of 1947 when total U. S. exports reached almost 53 million dollars.

Table 1 - United States Exports of Fishery Products, 1956-1960, by Country of Destination

Destination	1960	1959	1958	1957	1956
			(US\$1,000)		
Canada	10,309	8,644	9,200	7,253	8,107
United Kingdom	8,460	8,928	5,785	3,708	2,204
Netherlands	4,350	4,352	2,007	2,969	4,961
Japan	3,295	928	501	669	595
Philippines	2,494	5,587	2,578	6,027	8,065
Sweden	2,613	3,176	681	1,844	848
West Germany	2,201	2,888	3,043	5,099	6,121
Norway	1,390	1,296	1,063	970	1,065
Switzerland	1,082	762	387	463	473
France	1,048	766	68	259	428
Italy	643	303	158	259	339
Mexico	616	663	393	175	143
Belgium & Luxembourg	537	746	948	447	504
Venezuela	461	614	641	573	586
Australia	444	157	31	23	11
New Zealand	317	285	65	84	41
Greece	313	306	136	195	261
Cuba	175	787	490	721	743
All others	1,347	3,053	2,829	4,214	4,008
Total	44,165	44,241	31,004	35,952	39,503

1/Consists of shipments to 86 countries.

Canada displaced the United Kingdom as the leading market for United States fishery products in 1960, regaining the position held in the years 1955-58. Canada bought a variety of products, with shrimp remaining at the top of the list.

Table 2 - Exports of U. S. Fishery Products to Canada, 1960

Product	Value
	(US\$1,000)
Shrimp, canned	1,927
Shrimp, fresh and frozen	1,742
Salmon, canned	1,082
Salmon, fresh and frozen	369
Oysters, shucked	492
Seal furs	1,398
Fish and other marine animal oils	815
All other fishery products	2,484
Total	10,309

Not only did the United Kingdom drop back into second place in 1960, but the value of exports of United States fishery products dropped \$468,000 from 1959. Although canned salmon was still the major item shipped to the United Kingdom, it had dropped by \$1,264,000 or 15 percent.

Table 3 - Exports of U. S. Fishery Products to the United Kingdom, 1960

Product	Value
	(US\$1,000)
Salmon, canned	7,057
Salmon, fresh and frozen	150
Pearl essence	109
Seal furs	62
All other fishery products	1,082
Total	8,460

The Philippines dropped to fifth place on the list of customers for United States fishery products. This was mainly accounted for by a large reduction in purchases of both canned salmon (down \$996,000 from 1959) and canned California sardines (down \$1,843,000 from 1959).

Table 4 - Exports of U. S. Fishery Products to the Philippines, 1960

Product	Value
	(US\$1,000)
California sardines, canned	2,008
Squid, canned	402
Salmon, canned	9
All other fishery products	75
Total	2,494

Again in 1960, as in 1959, fish and other marine animal oils made up the bulk of United States fishery products exports to the Netherlands, West Germany, Norway, and Sweden. In fact these four countries received almost 87 percent of the total exports of fish and other marine animal oils. Exports of all

fishery products to these four countries amounted to \$10,412,000.

Table 5 - U. S. Exports of Fish and Other Marine Animal Oils, 1960, by Country of Destination

Destination	Value US\$1,000
Netherlands	3,780
Sweden	2,404
West Germany	1,888
Norway	1,335
Canada	815
All other countries	613
Total	10,835

Japan rose from 8th place to 4th place in the list of United States customers for fishery products. In 1960, Japan purchased unmanufactured shells valued at almost \$2,500,000 as compared with \$867,000 for the same product in 1959.

Table 6 - Exports of U. S. Fishery Products to Japan, 1960

Product	Value US\$1,000
Shells, unmanufactured	2,473
Salmon, fresh and frozen	457
Shrimp, fresh and frozen	196
Shrimp, canned	48
Shrimp, salted, pickled, or dried	48
All other fishery products	73
Total	3,295

Europe remained the leading continent receiving United States fishery products in 1960, although there was a slight drop in the total value from 1959. Europe again took more than 50 percent of the exports of fishery products. In 1960, as in the past several years, canned salmon valued at about \$7,600,000, and oils valued at \$9,800,000, were the major items shipped to Europe.

Table 7 - United States Exports of Fishery Products, 1960

Continent	Edible	Inedible	Total
		(US\$1,000)	
North America	8,978	3,622	12,560
South America	884	83	967
Europe	10,781	12,108	22,889
Asia	3,781	2,697	6,478
Africa	325	7	332
Oceania	873	26	899
Total	25,622	18,543	44,165

Table 8 - Major U. S. Fishery Products Exports, 1960

Product	Value US\$1,000	Percent of Total
Fish and other marine animal oils	10,835	25
Salmon, canned	9,830	22
Salmon, fresh and frozen	1,677	4
Shrimp, canned	3,383	8
Shrimp, fresh and frozen	2,303	5
Sardines, canned	3,508	8
Seal furs	3,309	7
All other fishery products	9,320	21
Total	44,165	100

Oils, canned salmon, canned sardines, and canned shrimp were among the leading export items in 1960. These products accounted for well over half of total United States fishery products exports.

Note: Also see *Commercial Fisheries Review*, Aug. 1960 p. 34.



U. S. Production of Fish Sticks and Portions, April-June 1961

United States production of fish sticks in the second quarter of 1961 amounted to 15.5 million pounds and fish portions 12.5 million pounds. This was an increase of 2.6 million pounds or 20 percent in fish sticks, and 2.0 million pounds or 19 percent in fish portions as compared with the same quarter of 1960.

Table 1 - U. S. Production of Fish Sticks by Months and Type, April-June 1961

Month	Cooked	Raw	Total
		(1,000 Lbs.)	
April	5,229	376	5,605
May	4,720	364	5,084
June	4,545	287	4,832
Total 2nd quarter 1961 1/	14,494	1,027	15,521
Total 2nd quarter 1960 2/	11,987	939	12,926
Total 1st 6 months 1961 1/	33,613	2,211	35,824
Total 1st 6 months 1960 2/	30,603	2,199	32,802

1/Preliminary.
2/Revised.

Cooked fish sticks (14.5 million pounds) made up 93 percent of the total fish stick

Table 2 - U. S. Production of Fish Sticks by Areas, April-June 1961 and 1960

Area	1961 1/ No. of Firms	1,000 Lbs.	1960 2/ No. of Firms	1,000 Lbs.
Atlantic Coast States	21	13,376	23	10,446
Inland and Gulf States	4	1,187	4	1,350
Pacific Coast States	10	958	7	1,130
Total	35	15,521	34	12,926

1/Preliminary.
2/Revised.

production, while the remaining 1.0 million pounds (7 percent) consisted of raw fish sticks. A total of 12.1 million pounds of breaded fish portions (of which 9.8 million pounds were raw) and 0.4 million pounds of unbreaded portions was processed during the second quarter of 1961.

The Atlantic Coast was the principal area for the production of both fish sticks and portions with 13.4 and 6.5 million pounds, respectively. The remaining 2.1 million

Table 3 - U. S. Production of Fish Sticks by Months, 1957-1961

Month	1961 1/	1960 2/	1959	1958	1957
		(1,000 Lbs.)			
January	6,066	5,504	6,277	5,471	4,261
February	7,059	6,535	6,352	5,925	5,246
March	7,178	7,837	5,604	5,526	5,147
April	5,605	4,864	4,717	4,855	4,492
May	5,084	3,700	4,407	4,229	3,380
June	4,832	4,362	4,583	4,702	3,522
July	-	3,684	3,790	4,574	3,821
August	-	5,006	3,879	4,358	4,643
September	-	5,417	5,353	5,328	4,861
October	-	6,554	5,842	5,485	5,162
November	-	6,274	4,831	5,091	4,579
December	-	5,322	4,743	5,467	4,014
Total	-	65,059	60,378	61,011	53,128

1/ Preliminary.

2/ Revised.

pounds of fish sticks and 6.0 million pounds of fish portions were produced in the inland, Gulf, and Pacific Coast States.

Table 4 - U. S. Production of Fish Portions by Months and Type, April-June 1961

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
			(1,000 Lbs.)		
April	825	3,549	4,374	141	4,515
May	872	2,923	3,795	104	3,899
June	547	3,341	3,888	157	4,045
Total 2nd quarter 1961 1/	2,244	9,813	12,057	402	12,459
Total 2nd quarter 1960 2/	1,506	8,552	10,058	434	10,492
Total 1st 6 months 1961 1/	4,960	21,525	26,485	903	27,388
Total 1st 6 months 1960 2/	3,385	17,912	21,297	827	22,124

1/ Preliminary.

2/ Revised.

Table 5 - U. S. Production of Fish Portions by Areas, April-June 1961 and 1960

Area	1961 1/		1960 2/	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . .	24	6,503	21	5,202
Inland and Gulf States . .	7	5,507	6	5,012
Pacific Coast States . .	6	449	5	278
Total	37	12,459	32	10,492

1/ Preliminary.

2/ Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1961

Month	1961 1/	1960 2/	1959	1958
		(1,000 Lbs.)		
January	4,259	3,604	2,692	1,973
February	4,865	3,434	3,025	1,254
March	5,805	4,594	3,225	1,471
April	4,515	3,399	2,634	2,268
May	3,899	3,171	2,684	1,478
June	4,045	3,922	3,247	1,504
July	-	4,020	2,227	2,161
August	-	3,496	2,796	1,516
September	-	4,543	3,558	1,566
October	-	5,148	4,314	2,560
November	-	4,642	3,483	1,979
December	-	4,327	3,262	2,060
Total	-	48,300	37,147	21,790

1/ Preliminary.

2/ Revised.

Virginia

NEW PLASTIC FLOATS TO TRACE MOVEMENTS OF YOUNG FISH:

Trawlers and dredge vessels are expected to catch brilliantly-colored plastic objects, looking like brightly-colored mushrooms, in their nets beginning about mid-July along the Continental Shelf and throughout Chesapeake Bay. These newly-designed bottom drift floats were released in the water by scientists of the Virginia Institute of Marine Science for studies of bottom currents in Atlantic and Bay waters. The floats are a replacement for the drift bottles generally used to trace ocean or water currents.

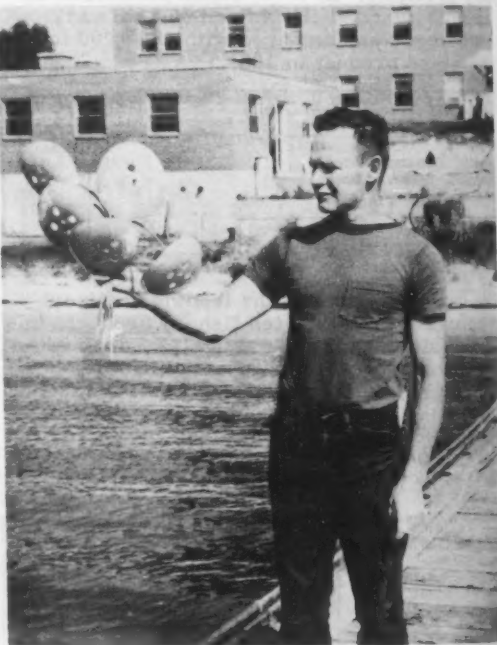


Fig. 1 - Associate Marine Scientist at the Virginia Institute of Marine Science, Gloucester Point, Va., holding a "bouquet" of plastic floats used for tracing ocean currents. Scientists at the Institute are cooperating with the Woods Hole Oceanographic Institute, Woods Hole, Mass. While surveying for fish eggs and larvae over the continental shelf, Virginia scientists toss overboard a record number of plastic floats. Beachcombers, trawl fishermen, and scallop dredgers are instructed to return them to Woods Hole.

The Institute's research vessel *Pathfinder* while engaged in its July 1961 off-shore cruise released a number of these floats at stations in the lower Bay and off-shore. A ring of salt holds several floats



together as they sink to the bottom. The salt ring quickly dissolves and the floats will drift with the subsurface currents and eventually be picked up by trawlers or dredges and returned to the Laboratory. A notation in each ship's log will indicate where the float was hauled aboard giving scientists valuable information regarding bottom currents of coastal and Bay waters.

In addition to permitting Virginia scientists to learn of water movements in and out of the Bay and over the adjacent shelf, these studies give a better understanding of why fishes are caught in abundance some years and are scarce during others. It has been established that the main spawning area for most Chesapeake fishes (gray sea trout, spot, croaker, menhaden, and fluke or flounder) is over the Continental Shelf offshore from Virginia. When the eggs hatch, the tiny larvae sink and are carried by bottom currents into the Bay, it is believed. During some years, the currents change course and cause the tiny fish to be carried to places other than the Bay, thus accounting for relatively small catches by sport and commercial fishermen in succeeding years.



Fig. 2 - D. F. Bumpus, Oceanographer at the Woods Hole Oceanographic Institute, Woods Hole, Mass., designed the plastic float (held in his left hand) for studying ocean currents. Old type glass drift bottle is held in the right hand.

One of the important reasons why the Institute's scientists have been carrying out their offshore research programs is in order to study the currents that are responsible for the distribution of fish eggs and larvae. A clear understanding of fish populations in Bay waters could not otherwise be obtained.

A reward will be paid for the return of floats to the Laboratory. The yellow floats resemble a saucer about the size of a dinner plate and have a pink tail about 18 inches long. They will not likely be found along shores or in still waters, since they move along the bottom with tides and currents.

The Virginia Institute is releasing the floats at the request of the Woods Hole Oceanographic Institution to assist the latter organization in their study of ocean currents along the coast of Virginia.

OYSTER MSX DISEASE REAPPEARS IN CHESAPEAKE BAY:

Evidence of this summer's first epidemic of the dreaded oyster disease MSX was reported early in July 1961 by biologists of the Virginia Institute of Marine Science. Regular inspections in June of oyster trays located at 26 stations throughout the Chesapeake Bay and its estuarine system in Virginia indicated a sudden rise in mortalities due to MSX infections.

From the disease's past history, two peaks of death are expected each summer--the first peak is reached in late July and the second in early September. This year's July epidemic appears right on schedule. Inspections of oysters in trays are conducted weekly during epidemic periods. Bimonthly checks are made during the other months.

"The epidemic is just now building toward the first summer peak kill," one of the biologists reported. "We know that oysters dying now were exposed to the disease late last summer. Those now being exposed to MSX for the first time, will have a high mortality rate during the epidemic expected to follow in September. Oysters planted during the last normal planting season (October 1960 through June 1961) will therefore be exposed during the current epidemic and die in large numbers during the one in September," he concluded. Once infected with MSX, a bed of oysters never quite reaches normal death

rates again; oysters continue dying throughout the year with major death peaks in summer and a minor one in winter.

Oyster tray stations are located in the Potomac, Little Wicomico, Severn, Rappahannock, York, and James Rivers, Mobjack Bay, and all along the seaside and bayside of Virginia's Eastern Shore. Local oysters and disease-free oysters from the upper James River are established in trays at each station for regular checks by the Institute's staff. Mortalities occurring during each check period are recorded. Laboratory diagnoses of oysters from trays are conducted daily to determine the extent of MSX infections. These tests are part of the over-all research program aimed toward finding a solution to the MSX oyster disease problem.

SCIENTIST PARTICIPATES IN FIELD TEST FOR CHEMICAL CONTROL OF OYSTER DRILLS:

A biologist from the Virginia Institute of Marine Science is now participating in field tests on the use of chemical barriers in controlling oyster drills at the U. S. Bureau of Commercial Fisheries, Milford, Conn., Biological Laboratory.

The Virginia scientist was invited by the Director of the Milford Laboratory to participate in and observe the use of certain chemical barriers which have been developed at the Milford Laboratory to prevent oyster drills from invading planted oyster grounds. This is a cooperative program between the Institute and the Bureau's Laboratory. The Virginia scientist will learn the techniques involved in using the chemical, evaluate the results of the test run, and consider the difficulties of applying and controlling the chemicals. From this information the Institute hopes to be able to determine the value of the use of this chemical barrier by Virginia oyster growers.

Virginia's Commissioner of Fisheries and scientists of the Institute have been especially interested in the applicability technique to Virginia conditions for some time. "We must test carefully the effect of these chemicals on the oysters themselves and on the organisms associated with oysters," the Institute's Director stated. "Though the technique shows promise, every aspect of introducing chemicals to oyster grounds

must be carefully considered so that no damage is done to the oysters themselves or to those organisms upon which the oyster depends," he added.

Predation from oyster drills, particularly on the seaside of Virginia's Eastern Shore, and also in the lower part of Chesapeake Bay, has been a major problem confronting oyster growers in those sections. These field tests are but one phase of a continuing oyster drill research program which has been in progress at the Institute for some time.



Washington

KING AND SILVER SALMON REARED TO MATURITY IN CAPTIVITY:

Chinook or king and silver salmon have been reared to maturity in captivity for the first time at the Washington State Department of Fisheries Bowman's Bay Station.

The possibility of rearing salmon in salt-water ponds until they reach maturity has long been a dream of fish culturists. A veteran supervisor of the State fish hatchery system, said that as far as he knows this is the first time salmon have been held in salt-water ponds until they mature.

Standard rearing ponds of 20 by 80 feet were used. Salmon were held to determine if they could be reared for a normal life span in artificial surroundings on an artificial diet, attain sexual maturity, and produce viable eggs that hatched normal offspring. The salmon were fed the normal production diet used in all state salmon hatcheries, made up of salmon viscera, beef liver, and vitamins.

The experimental lot of fall chinook fingerlings originated from eggs taken from adults trapped at the Samish River rack during the fall of 1954 and transferred to Bowman's Bay for rearing in salt water. A similar procedure was carried out with a small lot of 1955 brood chinook fingerlings. These two lots of fish were eventually combined and held in salt-water ponds at the hatchery until they reached maturity.

These chinook salmon matured at 2, 3, 4, and 5 years of age, following the same maturation pattern as their mates which migrated to sea and matured under natural

conditions. At two years of age, all maturing fish were males; at three years, over 95 percent were males. Maturing females were primarily 4 and 5 years old. Even those reaching 5 years of age were not over 3 pounds in weight, and approximated 19 inches.

In the fall of 1958, when fish were 4 years of age, a total of 63 females were spawned to determine fecundity and ability of eggs to survive. The fish were killed directly out of salt water, washed with fresh water, and then spawned. Eggs were shipped to the Samish River hatchery for incubation and hatching.

The eggs were approximately of normal size, but the average fecundity was only 456 eggs per female. Naturally-maturing female chinook migrating from the ocean will contain 3,000 to 5,000 eggs.

The chinook salmon eggs developed normally with an 18 percent mortality from the time eggs were taken until fry were placed in the ponds. This is higher than the expected loss, but 7 of the females had hard, non-fertilizing, glass-like eggs, which probably accounts for the above-normal loss. After 60 days of rearing in fresh water, the fish were returned to Bowman's Bay and converted to sea water. These fish were then reared for 285 days in the salt-water ponds and during that period developed normally in all respects. At the end of the rearing period the fingerlings attained an average weight of 56.7 grams (about 2 ounces) per fish.

These fish were utilized, during growth, by the Research Division to test several types of tags--plastic spaghetti, plastic dart, and plastic disc.

The silver salmon reared in captivity were 1954 brood. During the winter of 1957, 103 of the three-year-old silvers (54 males and 49 females) were spawned, yielding a total of 19,042 eggs. Average female fecundity was 388 eggs. The eggs were approximately normal in size, but a small percentage were hard and glass-like in appearance and these did not fertilize. The average weight of the spawned silvers was 0.91 pounds and the length averaged 14.3 inches.

The egg loss for the silvers during hatching was relatively high, totaling 3,977 (21 percent) and the fry loss, after 32 days of

rearing, at time of liberation was 881 fish (5.8 percent). At the time of release, these fingerlings did not show any abnormalities and in appearance were similar to fish that were offspring of naturally-reared parents.

Some of the 1954 brood silvers were not ready for spawning in the winter of 1947 and were held in the hatchery ponds for continued rearing. They matured in the fall of 1958 at four years of age. A total of 184 fish were spawned (104 males and 80 females) yielding 29,869 eggs (a fecundity of 373 eggs per female). Egg loss from take to hatching was only 12.5 percent, not considered excessive. A total of 25,500 fry were put into rearing ponds on April 14, 1959. These fish were reared for 383 days at Bowman's Bay, reached an average size of 21 fish per pound and had a total survival of 62.75 percent, from the time the eggs were taken to liberation. Some of the survivors (15,353) were sized out to an average weight of 25 fish per pound and marked with an adipose-both-ventral-fin clip, then liberated in the Samish River. Returns from those fish are expected in the fall of 1961.

Another small part of the survivors (601 fish) were sized out to an average weight of 4 fish per pound, tagged with Petersen disc tags and poly-vinyl spaghetti tags and liberated along with the fin-clipped group. Returns from those may also be expected in the fall of 1961.

The experiments, the technical assistant of hatcheries stated, show definitely that chinook and silver salmon can be reared to maturity in a hatchery pond supplied with salt water. Confinement had a depressant effect upon growth and limited the fecundity of the females to about one-tenth that of normal ocean-maturing adults moving in natural migratory periods. However, no obvious abnormalities occurred in the fry or fingerlings during the rearing period involved.

The hatchery experts said they saw no possibilities of rearing salmon in captivity for food or commercial purposes, due to the long time necessary for sizable growth and the costs involved.



Weather Station

ROBOT STATION IN GULF OF MEXICO:

In July 1961, a weird-looking apparatus resembling four huge aluminum waterless cookers set in an orange and white platform was lowered into the Gulf of Mexico, 300 miles south of New Orleans. This is a unique method of getting advance warnings of hurricanes, which may save dozens of lives and protect untold numbers of ships and aircraft.

Known as Nomad I, this sea-going robot does the work of a weatherman under circumstances too trying for humans. Nomad can operate far out at sea for at least two years, with no time off to eat, sleep, or get seasick in severe storms.

Nomad is the joint product of the National Bureau of Standards, U. S. Department of Commerce, and the Navy's Bureau of Weapons. The U. S. Coast Guard cutter Blackthorn out of Mobile was scheduled to put Nomad in place.

What goes over the side will be an aluminum platform, 10 by 20 feet in size, loaded with weather gear encased in four airtight aluminum wells sunk in the deck. After the Blackthorn's winch and boom carefully set the platform onto the ocean surface, the 15,000-foot mooring anchor system will be paid out, and the electronic instruments will be given their final adjustments by National Bureau of Standards engineers aboard the vessel.

At regular six-hour intervals, and every hour during high winds, the station will transmit weather data which its gear has measured and coded. At each transmission, Nomad tells the air temperature, water temperature, barometric pressure, wind speed and direction, and the direction of the ocean's surface currents.

Nomad transmits by shortwave radio, using partly variable-tone pulse signals and partly international Morse Code. Any-one with short wave receiving equipment can pick up the night-time signals.

In 1960, Nomad picked up the tell-tale signs of Hurricane Ethel on September 12 and broadcast data which alerted the Gulf Coast mainland approximately 48 hours before the storm itself struck. The ungainly-looking device was the first free floating, unmanned weather station in the history of weather monitoring to detect and report the presence of a tropical storm or hurricane. During the storm, Nomad partially parted its mooring and turned broadside to the heavy seas. Part of its topside equipment was submerged, but the station continued to transmit accurately and its signals were well received throughout the storm period.

These floating automatic weather stations, with their maze of electronic instruments, figure conspicuously in the planning of weather networks of the future. Although no phase of the extended test program has met with complete success, and some parts of the equipment undergo improvement each year, still, the moderately-priced (about \$50,000 per station) Nomad can be designed and anchored to hold position and transmit effectively in any non-freezing ocean area, without attendance and without maintenance for fully two years. With minor refurbishing after that period, the station will have a life expectancy of at least ten years.

Nomad will soon go into production, and seven will be established as Navy stations in storm-producing localities in the Atlantic and Pacific oceans. After the pilot production models have been proven, it is likely that Nomad will be used by the U. S. Air Force and the National Bureau of Standards' sister Commerce agency, the Weather Bureau. Not only military, but private and commercial ships and aircraft will profit immeasurably by the advance storm warnings thus provided.



Wholesale Prices, July 1961

The over-all price index for edible fishery products (fresh, frozen, and canned) for July 1961 at 129.2 percent of the 1947-49 average was down slightly (0.2 percent) from the preceding month and 0.5 percent lower than in the same month of 1960. Lower prices for fresh drawn haddock and fresh shrimp were largely responsible for the slightly lower index in July this year as compared with the preceding month. The same items plus fresh haddock fillets and frozen shrimp contributed to the slight drop in the index between July 1960 and this July.

The fresh and frozen drawn, dressed, and whole finfish subgroup index in July 1961 dropped 3.6 percent from a month earlier due to lower wholesale prices for all subgroup items except yellow pike (up 2.6 percent). In mid-July this year, prices dropped from a month earlier for fresh drawn haddock at Boston by 10.8 percent, fresh dressed halibut and salmon at New York City by 5.4 percent and 1.4 percent, respectively and fresh drawn Lake Superior whitefish at Chicago by 13.1 percent. The drop of 11.3 percent in the subgroup index from July a year ago to this July was due primarily to sharply lower prices for fresh large drawn haddock (down 43.3 percent), fresh dressed salmon, and the fresh-water species. An increase of 2.0 percent in the fresh halibut price this July over the same month of 1960 partially offset the lower prices for the other items.



New York Fulton Fish Market.

Wholesale prices for the fresh processed fish and shellfish subgroup from June to July this year and from last July to this July were about unchanged. Fresh shrimp supplies at New York City from the South Atlantic States improved and wholesale prices dropped 6.5 percent from June to July this year. The drop in the fresh shrimp price from June to July this year was just about offset by an increase of 6.7 percent in the fresh shucked oyster price. As compared with the same month of 1960, the July 1961 fresh scrod haddock fillet price was down sharply (36.2 percent) due to better landings of small haddock, and fresh shrimp prices were down 8.3 percent. These decreases were balanced out by an increase of 14.3 percent in the price for fresh oyster meats.

Wholesale prices in July this year for frozen processed fish and shellfish were up about 1.9 percent from the preceding month due to an increase of 2.9 percent (2 cents a pound) in the frozen shrimp price at Chicago and an increase of 1.6 percent (about 1/2 cent a pound) in the frozen skin-on haddock fillet price at Boston. Partially offsetting the increases were declines of about 1/2 cent a pound in prices for frozen flounder and ocean perch fillets. As compared with July 1960, the subgroup index this July was lower by 2.1 percent. Higher prices for frozen haddock (up 22.2 percent) and ocean perch fillets (up 5.7 percent) were more than offset by a drop of 9.8 percent in the frozen shrimp price.

The canned fishery products subgroup index in July 1961 was about unchanged from a month earlier except for a 3.2-percent rise in the first-hand price for Maine sardines. The canned Maine sardine pack as of the end of July this year was extremely light. Other canned fish subgroup prices remained unchanged in July this year at the levels which have prevailed for the past few months. However, the subgroup index was up 7.3 percent from July a year ago due to higher prices for canned pink salmon, and both Maine and California sardines.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1961 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-48=100)			
			July 1961	June 1961	July 1961	June 1961	May 1961	July 1960
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					129.2	129.5	128.6	129.9
Fresh & Frozen Fishery Products:					140.8	2/141.6	2/141.6	2/147.7
Drawn, Dressed, or Whole Finfish:					146.5	151.9	151.8	155.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.09	77.5	86.9	78.1	136.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.37	108.3	114.5	107.8	106.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.87	.88	194.3	196.6	197.7	198.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.63	.61	131.4	151.2	163.6	156.2
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.58	.57	136.0	132.5	167.7	158.3
Processed, Fresh (Fish & Shellfish):					146.0	145.4	142.1	146.0
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.29	.29	98.7	98.7	98.7	154.8
Shrimp, lge. (26-30 count), headless, fresh. . .	New York	lb.	.73	.78	114.5	122.4	120.9	124.8
Oysters, shucked, standards	Norfolk	gal.	8.00	7.50	198.0	185.6	179.4	173.2
Processed, Frozen (Fish & Shellfish):					115.3	113.2	112.2	117.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	102.1	100.8	100.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.33	103.6	102.0	100.5	84.8
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	112.8	114.8	116.8	106.7
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.71	.69	109.6	106.5	105.7	121.5
Canned Fishery Products:					112.4	112.0	112.0	104.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. .	Seattle	cs.	28.00	28.00	146.1	146.1	146.1	137.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.00	11.00	79.3	79.3	79.3	80.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	105.0	105.0	105.0	99.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.03	8.75	96.1	98.1	93.1	93.1

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/New series indexes based on new weighting structure; not previously available.

Note: New series indexes for January-April for the category "All Fish and Shellfish (fresh, frozen, and canned):" January 131.3, February 133.3, and March 132.0. For category "Fresh and Frozen Fishery Products:" January 146.6, February 149.3, and March 146.7; not previously available. See Commercial Fisheries Review, August 1961, for explanation.



FIRST PACK OF CANNED SALMON IN 1864

"The first pack of canned salmon in 1864 totaled only 2,000 cases but the packers had a great deal of difficulty in selling this quantity, disposing of some in door-to-door sales before wholesale buyers could be found for the remainder. The tuna-canning industry in the United States dates from 1903 and the pack of that year was 250 cases (Cobb 1919). After 9 years of effort the total pack of canned tuna was only 78,900 cases."

--Principles and Methods in the Canning of Fishery Products,
Research Report No. 7 (page 43),
U. S. Fish and Wildlife Service.



International

FISHING LIMITS

NORDIC DISCUSSIONS:

The Danish Government has asked Iceland to start negotiations in the near future on Faroese fishing rights in Icelandic waters, the Danish Foreign Minister announced on June 22.

On the same day, the Danish Fisheries Minister reported on the recent Scandinavian negotiations in Oslo regarding fishing limits in the Skagerrak and the Kattegat. No results were reached, since the Danes could not accept a Swedish-Norwegian proposal to maintain the status quo for those waters, while Norway would simultaneously be extending its fishing limit from Kap Lindesnes in the south to the Soviet border in the north to 12 nautical miles. Further discussions were expected to take place in July.

No decision has yet been made as to whether Danish fishing limits are to be extended, declared the Danish Fisheries Minister, but the Government expects Danish fishery associations soon to submit demands for a 12-mile limit in Danish waters. (United States Embassy, Copenhagen, June 27, 1961.)

FISH OILS

WORLD EXPORTS CONTINUED UPWARD IN 1960:

World exports of fish oils (including fish-liver oils) reached an alltime high of 300,000 short tons in 1960, reflecting record shipments from Iceland, Peru, and the Republic of South Africa. This was an increase of 35,000 tons from the previous high of 1959 and two-thirds larger than the 1950-54 average.

Iceland's exports of fish oil in 1960 were nearly triple the shipments of the previous

year. Large supplies of oil from a good fish catch in 1959 and increased Government subsidies for the processing and export of fish oil helped push exports up sharply. Iceland's exports may decline somewhat this year because prices paid to processors for salted fish were increased in late 1960, as the result of unfilled fish contracts with several Eastern European countries. Lower stocks and production of other marine oils accounted for the slight decline in fish oil exports from Norway.

Peru's fish oil exports continued to rise sharply in 1960. Shipments were double those of 1959--the first year of large exports due to the recent growth of the Peruvian fishing industry. Fish oil exports are expected to continue upward but possibly at a reduced rate because the fear of overexpansion and lower prices, as experienced by the fish meal trade, is of some concern to the processing industry. Most of Peru's exports goes to the Netherlands and West Germany for further processing and re-export, mostly to other European countries.

Fish oil exports from the Republic of South Africa in 1960 were 40 percent above

Continent and Country	1960 ^{1/}	1959 ^{1/}	1958	1957	Average	
					1950-54	1955-59
(1,000 Short Tons)						
North America:						
Canada	14.9	14.4	5.8	3.9	11.8	18.9
United States	71.8	72.3	47.0	58.5	42.9	1.3
Total	86.7	86.6	52.8	62.3	54.7	19.2
South America:						
Peru	38.6	18.9	1.8	4.8	.1	-
Europe:						
Denmark	8.6	17.1	12.6	9.8	6.3	2.5
Germany, West	26.2	31.6	17.9	14.3	3.0	2/4.4
Iceland	59.7	18.5	27.4	20.9	19.6	24.5
Netherlands ^{2/}	7.5	16.0	13.0	7.1	14.5	.3
Norway ^{3/}	18.2	21.0	22.3	18.6	30.4	98.0
Portugal	4.9	5.7	5.5	4.2	3.8	.1
United Kingdom	3.7	3.7	3.5	3.4	4.0	6.0
Total	129.9	113.7	102.3	78.3	81.6	75.1
Africa:						
Angola	5.7	5.6	9.4	13.4	6.7	.7
Republic of South Africa	36.5	26.0	18.1	11.4	8.9	2.3
Total	42.2	31.6	27.5	24.8	15.6	2.9
Asia:						
Japan	3.8	3.6	6.6	3.5	6.8	35.0
World Totals^{4/}	300.0	285.0	280.0	180.0	177.0	135.3

^{1/} Preliminary.

^{2/} Total Germany.

^{3/} May include some whale oil.

^{4/} Does not include crude quantities of fish-liver oil which are reported annually.

^{5/} Includes estimates for minor reporting countries.

International (Contd.):

the previous year. As the result of successively large fish-catch quotas each year, the outturn of fish oil has increased rapidly since the mid-fifties. Although the Government exercises close control over the industry to conserve resources, the fishing season, formerly confined to the March-November period, presently is unlimited.

Shipments of fish oils from the United States, the world's largest producer and exporter, were down slightly in 1960. A larger outturn of fish oil resulted in a sharp build-up of stocks from a low level at the beginning of the year. Larger exports to Canada, probably due to smaller domestic production than in the first quarter of 1960, mostly offset slightly smaller shipments to Europe. Smaller United States exports to Europe were in part the result of increased fish oil shipments from Peru and Iceland and the favorable price levels of United States soybean and cottonseed oils during most of the year. Total United States fish oil exports, January-April 1961, were 22,000 tons--down about 5,000 tons from a year earlier.

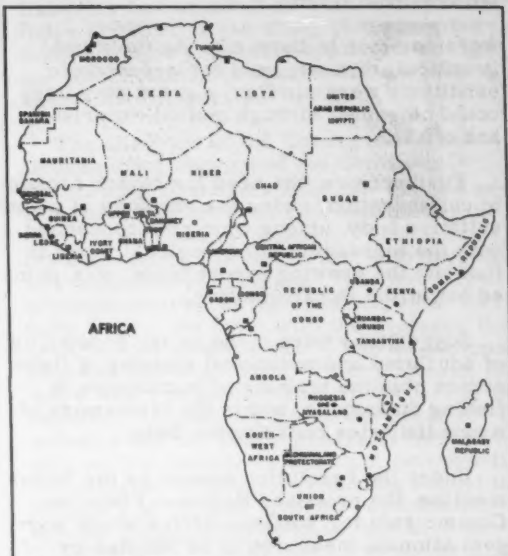
Europe is the world's largest market for fish oil. Although several countries are major exporters, most of the shipments are to other European countries. Denmark and West Germany import large quantities of crude fish oil for processing and re-export as an edible oil for use in margarine production by other European countries. (Foreign Crops and Markets, June 29, 1961, U.S. Department of Agriculture.)

Note: See *Commercial Fisheries Review*, April 1961 p. 44, February 1960 p. 60.

FOOD AND AGRICULTURE ORGANIZATION

FISHERIES COMMISSION FOR WEST AFRICA PLANNED:

A proposal for a new fisheries consultative body for Western Africa will be placed before the Food and Agriculture Organization of the United Nations (FAO) when its Council meets in Rome this year. The new commission is the result of an FAO-sponsored meeting held at Dakar in June, where delegations from eight nations met to consider establishing a body in the western part of Africa to serve that area in a manner similar to other FAO fisheries bodies in the Mediterranean and Indo-Pacific regions.



The proposed commission would include FAO member countries between Cape Sparte and the Cape of Good Hope, whose territories lie wholly or partially within regions which drain into the Atlantic Ocean and Lake Chad.

Establishment of the commission was proposed unanimously by the delegates representing Ghana; Guinea, the Ivory Coast, Liberia, Nigeria, Portugal, Senegal, and Spain; the proposal was supported also by Sierra Leone and Togo. Representatives from France, the Islamic Republic of Mauritania, the United States, and the Commission for Technical Co-operation in Africa south of the Sahara attended as observers, and spoke in support of this proposal.

The delegates were unanimous in agreeing that such a regional fisheries body was necessary. They felt that problems not only of oceanography and marine biology, but also concerning the inland waters, must be considered as a whole from the geographical point of view, disregarding political frontiers. This would apply to coastal fisheries such as sardinella to fishing on the high seas, and also to the fisheries of the great river basins.

The countries agreed that the technical problems arising from fishing, such as catching, processing, storing and distribution,

International (Contd.):

were common to them all. As their geographical, climatic, and socio-economic conditions were similar, a great advantage could be gained through mutual experience and effort.

Furthermore, the need for closer economic collaboration, under the auspices of a consultative body, among countries concerned with the increasing inter-regional trade in fish and the growing export trade, was pointed out at the Dakar meeting.

Suggestions were made on the possibility of education and vocational training of fishermen plus the training of instructors in fishing techniques, within the framework of a new fisheries consultative body.

Under the resolution passed by the Dakar meeting, the proposed Regional Fisheries Commission for Western Africa would suggest common measures to be adopted by member countries for drawing up and co-ordinating a common program of research for fisheries and related problems; for securing rational and co-ordinated exploitation of their fisheries resources and in the fields of co-ordinated effort of fishery documentation, and in the education and training of qualified fisheries personnel.

COUNCIL APPROVES WEST AFRICAN AND EUROPEAN FISHERY COMMISSIONS:

Two new fishery commissions, one for Europe and the other for Western Africa, were approved by the Council of the Food and Agriculture Organization (FAO) during its 35th session in Rome, Italy, in June 1961. The 25-nation Council met to review proposals for FAO's activities and budget for 1962/63 and to develop a provisional agenda and outline of work for the full 88-member Conference's session in November 1961.

The European Inland Fisheries Advisory Commission (EIFAC) which held its initial session in Dublin in April 1960, had its rules of procedure confirmed by the Council. The establishment of such a commission was approved by the Council in 1957.

The Council also approved in principle the establishment of a Regional Fisheries Commission for Western Africa. A text concerning the proposed Commission's

terms of reference and procedures will be prepared for approval by the Council when it meets again prior to the FAO Conference in November.

The EIFAC had five basic points for its first working platform. They were mutual aid; fish-pond culture; a survey of lakes and streams; pollution control and fish diseases; and a review of the principal species of European fish. Its member nations are: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Israel, Italy, the Netherlands, Portugal, Turkey, the United Kingdom, and Yugoslavia.

The West African commission will be concerned with the region extending from Cape Spartel to the Cape of Good Hope and would serve that area in a manner similar to other FAO fisheries bodies in the Mediterranean and Indo-Pacific regions.

WORKING PARTY OF EXPERTS TO INCREASE FISH MEAL AND FLOUR DEMAND APPROVED BY COUNCIL:

In other fishery matters, the Council considered a recommendation made by the International Meeting on Fish Meal in Rome in March 1961, that a working party of experts be set up under the aegis of FAO to increase the demand for fish meal and fish flour. This expert group would ascertain the fish meal and fish flour requirements of potential consuming countries.

This recommendation was approved in principle by the Council and sent to the FAO Director-General for implementation. The Council suggested that the expert group could be convened simultaneously with the September International Meeting on Fish in Nutrition in Washington, D.C., since most of the experts who would form the proposed working party would be at the Washington meeting.

MEETING ON ECONOMIC EFFECTS OF FISHERY REGULATIONS CONCLUDES MORE FACTS NEEDED:

A need to supply more relevant facts about conditions in specific fisheries, in order to aid administrators in developing fish-

International (Contd.):

ery regulations, was voiced by a fisheries officer of the Food and Agriculture Organization (FAO) in summing up the FAO Expert Meeting on Economic Effects of Fishery Regulations, held in Ottawa June 12-17.

"Biologists, economists, and other specialists in fisheries still need to combine in assembling the data required by policy-makers," said the Chief of the Biology Branch, FAO Fisheries Division. "Experts in different disciplines must be encouraged to acquire a knowledge of each other's techniques to blend their efforts. A mere addition to research results of projects pursued along separate lines will not suffice.

"But a good start has been made at this meeting in approaching the problems of managing fisheries along national lines by bringing specialists together from different fields."

The purpose of the meeting was to add to the theoretical knowledge of the economic management of fisheries. Until recently, regulating fishery resources was a means of protecting these resources and maintaining a steady yield. However, a rate of fishing that produced maximum steady yield might not necessarily be the most economical one.

The meeting was attended by 70 representatives from 20 countries and international fishery commissions.

Discussion panels were formed for the purpose of considering fishery regulations under several headings: the economics of regulating fisheries; the effects of fishery regulations on the catch of fish; the regulation of the Pacific halibut fishery; the Pacific coast salmon fishery; the regulation of the South African west coast shoal fisheries; the Atlantic lobster industry; the Japanese trawl fishery; and the North Atlantic fisheries.

An Associate Professor of the University of Washington Department of Economics supported the demand for additional case studies of specific fisheries and pointed out that the experience gained could be of great potential use in providing technical assistance to developing countries. "Fishery regulations in developed countries have been instituted for the most part only after

unsatisfactory conditions in already-exploited fisheries had arisen," he said. "The knowledge acquired in the study of these situations could be profitably applied in designing sound control programs for as-yet-unexploited fisheries."

The Director of the Conservation and Development Service of the Canadian Department of Fisheries said that the one sector which had not been represented at the meeting was policy-making. "Legislators, my experience has taught me, will respond to reasonable persuasion. It is the duty of administrators and technical experts, therefore, to provide them with the evidence they need for policy decision." The educational process had to go even farther, he said, for there was a responsibility on the part of the experts, "to get the facts to the public." The industry and the public generally had to know why control measures were put into practice, including the economic reasoning behind the advocacy of certain types of regulations.

Note: See Commercial Fisheries Review, May 1961 p. 38.

NORTHWEST ATLANTIC FISHERIES COMMISSION

REPORT ON
ELEVENTH ANNUAL MEETING:

Actions affecting the fisheries of the entire area in the North Atlantic from Greenland to Rhode Island marked the Eleventh Annual Meeting of the International Commission for the Northwest Atlantic Fisheries, held in Washington, D.C., June 5-10, 1961. Although cod and haddock are already under regulation in 3 of the 5 subareas of the Convention area, recommendations or resolutions passed at the last meeting look toward regulating all groundfish in the entire Convention area and sea scallops and harp and hood seals as well.

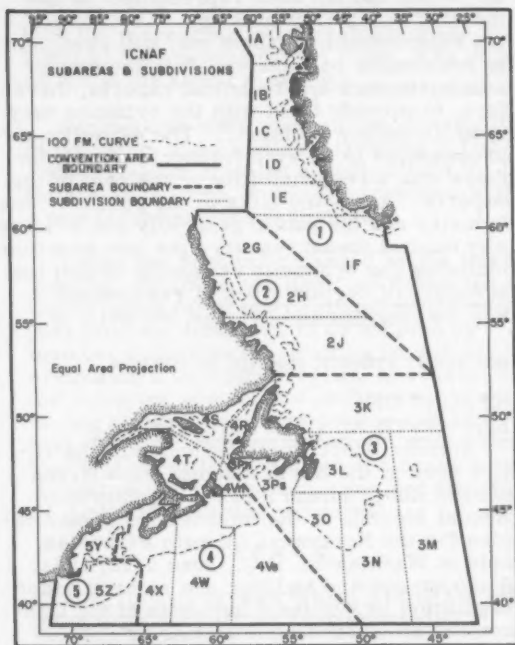
Trawl Mesh-Size Regulations: Recommendations for a number of mesh-size regulations resulted from the Commission's receiving a report of a special committee on assessment of the effects of increasing mesh size in the Convention area. The committee, which was appointed two years ago, submitted a voluminous report that outlined the immediate and long-term effects of different mesh sizes for most of the stocks of the important groundfish species in the Northwest Atlantic.

Recommendations were made limiting the size of mesh in the various subareas as follows (the figure shown on the following page shows the five subareas established for management purposes):

International (Contd.):

1. In Subareas 1 and 2, a minimum mesh size of $4\frac{1}{2}$ inches for all species of groundfish including ocean perch or redfish. To date these subareas have been unregulated.

2. In Subarea 3, a minimum mesh size of $4\frac{1}{2}$ inches for all groundfish in the entire



International Commission for the Northwest Atlantic Fisheries--subareas and subdivisions.

subarea except for ocean perch or redfish in the southern part of the subarea where the ocean perch are smaller (subdivisions N, O, and P). The present regulation in this subarea calls for a minimum of 4 inches for cod and haddock only.

3. In Subarea 4, a minimum mesh size of $4\frac{1}{2}$ inches for cod, haddock, and flatfishes. The present regulation which specifies a minimum of $4\frac{1}{2}$ inches applies only to cod and haddock.

4. In Subarea 5, the $4\frac{1}{2}$ -inch minimum for cod and haddock was left unchanged.

Thus, when these recommendations were implemented, there will be a uniform minimum mesh size of $4\frac{1}{2}$ inches throughout the Convention area for nets used in fishing for cod and haddock. Flatfishes will be under a $4\frac{1}{2}$ -inch minimum mesh size from Greenland to the southern end of Nova Scotia, and ocean perch or redfish will be under the same minimum size on all grounds north of the southern part of the Grand Bank.

Fishing effort in the Northwest Atlantic has increased in recent years and the pressure is expected to mount even higher. There was general agreement in the Commission that, under these circumstances, increasing mesh size for all ground fish in the Convention area would be beneficial. The Commission expressed the opinion that it should look forward to bringing the ocean perch or redfish of the southern part of the Convention area, as well as silver hake (whiting) and flatfishes in Subarea 5, under mesh regulation as soon as possible. There was also considerable interest in increasing the mesh size above $4\frac{1}{2}$ inches for cod, haddock, and flounders.

Sea Scallop Conservation: The conservation of sea scallops was given considerable attention by the Commission who recognized that scientific evidence indicates the present ring size used in scallop dredges is too small to maintain maximum sustained yield at present fishing levels. The Commission would welcome a proposal for increasing ring size at its next annual meeting. Canadian and United States scientists agreed to work cooperatively in determining the optimum size of ring to use and in developing a specific proposal for a sea scallop ring size regulation.

Atlantic Seals: The harp and hood seals of the Northwest Atlantic have recently been subjected to greatly increased fishing pressure. More countries are hunting them, using more efficient methods, with the result that the populations have been severely reduced during the last decade. To bring these mammals under control, the Commission recommended that the Convention be amended to bring harp and hood seals under the provisions of the International Commission for the Northwest Atlantic Fisheries. It was accordingly recommended that a separate panel be established for the purpose of dealing with the conservation requirements of harp and hood seal populations.

International (Contd.):

Regulations Enforcement: The question of adequate enforcement of regulations in the Convention area was given considerable attention. At the present time each country is responsible for policing its own nationals. The Commission expressed interest in international inspection of fishing vessels and appointed a committee to study the feasibility of such inspection in the ICNAF area.

Trawl Chafing Gear: The use of topside chafing gear by some countries has always been a troublesome problem since it may interfere with the escape of small fish. The form of chafing gear to be used is now carefully spelled out in the mesh regulations but it is still considered undesirable from a conservation standpoint. A committee was formed to examine the possibility of eliminating all topside chafing gear over cod ends of nets.

Other Related Meetings and Actions: During the week preceding the Washington meeting, the Commission's Committee on Research and Statistics met in Woods Hole, Mass. The scientific advisers to the various panels also met during this week at Woods Hole. The scientists reviewed the research and statistical reports of the member countries on the basis of which they prepared special reports for the consideration of the Commissioners in Washington.

The scientific groups reviewed a report of a special international committee on environmental studies in 1963. The International Council for the Exploration of the Sea will be asked to co-sponsor this symposium. Another result of this committee's work is a plan for joint action of countries interested in Subarea 1 (west coast of Greenland). A multiship survey of the area is planned for 1963 to learn more about the oceanographic conditions in the area in relation to the drift of plankton and fish larvae.

Preceding the meetings of the Committee on Research and Statistics, a 4-day symposium on fish marking was held in Woods Hole. Over 60 contributions were submitted to this symposium covering the main topics: methods and effectiveness of marking, tagging, and tag recovery, and analysis of results. Many new ideas developed from the symposium which will be valuable in planning tagging programs in the ICNAF area. These include new methods of tagging, new techniques for measuring the efficiency of tag recoveries, and new methods for estimating population size and mortality rates.

Reports of research pertinent to ICNAF problems, statistics on each country's catch in the Convention area, and results of biological sampling of the catches are published annually by the Commission in three publication series: the Annual Proceedings, the Statistical Bulletin, and the Sampling Yearbook.

During its Washington meeting, the commission elected the following officers to serve for 2 years: Commission Chairman, George R. Clark, Deputy Minister of Fisheries, Ottawa, Canada; Commission Vice Chairman, B. Dinesen, Under Secretary of the Fisheries Ministry, Copenhagen, Denmark.

The International Commission for the Northwest Atlantic Fisheries was established under a convention between 10 North American and European countries which came into force on July 3, 1950. Since then, two additional governments have become parties to the convention, namely, the Federal Republic of Germany (1957) and the U. S. S. R. (1958). The present member nations are: Canada, Denmark, France, Federal Republic of Germany, Iceland, Italy, Norway, Portugal, Spain, Soviet Union, United Kingdom, and United States.

NORTHWEST ATLANTIC FISHERIES CONVENTION**THREE COUNTRIES SIGN
DECLARATION OF UNDERSTANDING:**

Denmark, the United Kingdom, and Spain in May 1961 signed the declaration of understanding regarding the International Convention for the Northwest Atlantic Fisheries of February 8, 1949. Done at Washington April 24, 1961 (not in force). The three countries signed without reservations as to acceptance. (Department of State Bulletin, May 22, 1961.)

**UNITED STATES INVITES FAO TO HOLD WORLD
MEETING ON TUNA BIOLOGY IN CALIFORNIA**

The United States Government is inviting the Food and Agriculture Organization (FAO) to hold its World Meeting on the Biology of Tuna and Tuna-like Fishes in July 1962 in the San Diego area in California. The fundamental objective of the conference is to assess the potential of the world's tuna stocks. The tunas, which were discarded fish a half century ago, are now fished in every ocean except the Arctic and the Antarctic and by fishermen of many nations. It is hoped that from the conference will come a composite picture of the rate of utilization and the possibilities and limits of future development.

Officials of the Department of State and Department of the Interior have been confer-

International (Contd.):

ring for some time on arrangements for the meeting. The United States tuna industry, which is centered in California, and the California congressional delegation have endorsed the proposal for a conference. Governor Edmund Brown of California has extended the State's hospitality to the members of the conference.

The decision to hold a world meeting on the biology of tuna arose from the successful meeting on sardines called by the FAO in Rome, Italy, in 1959. The rapid development of tuna fisheries throughout the world emphasized the need for tuna researchers to meet and discuss the biological and oceanographic programs now being conducted. The need for coordination of the work of the various tuna research scientists is also becoming evident as the importance of that resource continues to grow.

The FAO decided that the 1962 meeting should cover the biological aspects only of tuna and tuna-like fish. Consideration will be given later to meetings on the economic and technological phases.

Under the general plan of the meeting only the species of tuna and tuna-like fish which are of commercial importance will be considered. The scope of the inquiry will include the development of the various fisheries, the

identity, distribution and behavior, and the potential yields of the various stocks; specific problems and outlook for future cooperation in coordination of methods and research programs; and ways in which international cooperation can be made possible.

WORLD

1958 LANDINGS AT SOME OF THE WORLD'S LEADING FISHING PORTS:

In 1958, about a dozen major fishing ports in selected foreign countries and the United States accounted for a good share of the world's total fish landings. The fishing port of Callao, Peru, in 1958 led all other ports with total landings of 273,000 metric tons (601.9 million pounds). The Peruvian catch was believed to consist mainly of anchovies used in that country's greatly expanded fish meal industry. Walvis Bay in South-West Africa ranked in second place with 235,000 metric tons (518.1 million pounds). The Walvis Bay pilchard (sardine) production was an important part of that African port's 1958 landings. The port of Bremerhaven in West Germany was in third place with total fish landings of 230,000 metric tons (507.1 million pounds).

Landings data covering individual fishing ports in the U.S.S.R. and Communist China are unavailable for 1958. New fishery developments and expansion in the Soviet fishing fleet would no doubt place fishing ports in that country in the forefront among the world's larger fishing ports.

San Pedro, Calif., was the leading fishing port of the United States in 1958 (379.9 million pounds with an ex-vessel value of \$29.3 million). Landings at that port consisted largely of tuna, jack and Pacific mackerel, anchovies, and sardines. Lewes, Del., a menhaden or industrial fish port, was in second place (270.0 million pounds), followed by Reedville, Va., (236.9 million pounds), another leading menhaden port. Gloucester, Mass., with landings of 230.2 million pounds (mainly ocean perch, whiting, and industrial fish) ranked fourth among the leading United States fishing ports.

Landing at Some of the World's Leading Fishing Ports, 1958

Country	Port	Quantity	Value	
		1,000 Metric Tons	US\$ 1,000	National Currency (In Millions)
Denmark	Esbjerg	213.9	10,931	75.5 Kroner
France	Boulogne	109.9	21,276	10,437.5 Francs
German Federal Republic	Bremerhaven 1/	229.9	26,266	109.7 Marks
" "	Cuxhaven 1/	123.7	13,635	57.0 "
Iceland	Reykjavik	100.8	-	2/
Peru	Callao	272.5	-	2/
"	Chimbote	195.4	-	2/
Portugal	Leixoes	102.8	8,350	24.1 Escudos
South Africa, Union of	Capetown	100.0	-	2/
South West Africa	Walvis Bay	232.5	-	2/
United Kingdom	Hull	208.0	36,541	£13.6
"	Grimshy	162.1	34,467	£12.3
United States	San Pedro, Calif.	172.3	29,300	-
" "	Lewes, Del.	122.5	3,775	-
" "	Reedville, Va.	107.0	3,198	-
" "	Gloucester, Mass.	104.0	7,965	-

1/Trawl-caught landings only.

2/Unavailable.

Note: (1) Prevailing 1958 official exchange rates used for conversion to U. S. dollars. (2) Only ports with landings of over 100,000 metric tons shown.

Aden Protectorate

GOVERNMENT AIDS FISHERIES:

It has been announced that the Aden Protectorate Fisheries Department plans to build a fish-curing station at Shuqra in Fadhli State to study different methods of salting fish in order to assist the fishing industry and to expand the market for salted fish in the Protectorate.



The Government has purchased a 30-foot motor fishing vessel at an estimated cost of £3,000 (about US\$8,400) from British Colonial Development and Welfare Funds for use by the Fisheries Department on the waters off the Western Aden Protectorate. The vessel is

fitted with an echo-sounder and carries gear to carry out experiments with 12 different methods of fishing. (United States Consulate in Aden, May 8, 1961.)



Africa

FISHERY NEWS BRIEFS:

Fishery Research Vessel for Nigeria: The Nigeria Ministry of Economic Development is publishing plans to secure and place in operation a special research vessel to operate out of Lagos to speed research in the sea fisheries of Nigeria and the inland fisheries of the Niger River and Lake Chad. (The Fishing News, London, May 19, 1961.)

Tuna Fishing off Sierra Leone: United States and Japanese tuna boats have found tuna abundant outside the territorial waters off Sierra Leone. Storage of frozen tuna is handled by an Italian firm for shipment to the United States. Plans include a cannery to be built at Freetown. (The Fishing News, London, May 19, 1961.)

Freezing Center at Accra, Ghana: One of two Ghanaian fishery trainees, studying various aspects of the fishing industry in Great Britain, stated that a large freezing center is being built at Accra to handle fish. (The Fishing News, London, June 2, 1961.)

Trade Agreement Between Tunisia and Poland Includes Fishing Vessels: In the renewal of the trade agreement between Tunisia and Poland, fishing vessels are included in the list of Polish products which may be imported into Tunisia. (U. S. Foreign Service Despatch, Tunis, May 31, 1961.)

Alexandria, Egypt, to be Site of Repair and Shipbuilding Yards for Fishing Vessels: It is reported that repair and shipbuilding yards for fishing vessels are to be built at Alexandria by Poland. (The Fishing News, London, May 19, 1961.)



Australia

TUNA CATCH HITS 5,000 TONS:

Australia's 1960/61 tuna catch, landed in New South Wales and South Australia, for the first time touched the 5,000-ton mark. Of the total, 2,582 short tons were landed in New South Wales and 2,254 tons in South Australia. To this must be added some fish ordinarily used for other than canning purposes; tuna taken in South Australia after May 24, although the season seemed then to be over; tuna taken in other states (49 tons in 1959/60.)

A feature of this tuna season was the fact that although New South Wales had a record catch, South Australia jumped to near parity with it as a tuna producing state. Last year South Australia produced 1,535 tons.

The 1960/61 tuna catch of about 5,000 tons has made tuna the No. 2, instead of No. 4, fish in Australia by weight of catch second only to mullet (1959/60 mullet catch 6,168 tons). In 1959/60 the shark catch totaled 4,228 tons and Australian salmon 3,800 tons. (Australian Fisheries Newsletter, June 1961.)



Bahama Islands

SPONGE BEDS REOPENED:

The Bahamas Agricultural and Marine Products Board has announced that the Colony's sponge beds, which have been closed for four years owing to a blight, are now reopened.

In its notice, the Board pointed out that "there appears to be a fairly good market for wool sponge, but only a fair market for grass sponge. There seems to be no demand whatsoever for yellow, hardhead, and reef sponge."

The Bahamas Government also announced that it will not be conducting a "Sponge Exchange as in the past, but fishermen will be permitted to sell their sponges directly to merchants."

Impetus for reopening the sponge beds came from natives of the Andros Island district and their representatives in the Bahamas House of Assembly. Officials of the Bahamas Agricultural and Marine Products Board are not overly sanguine about the possibilities of reviving the sponge industry, which was once

Bahama Islands (Contd.):

a major export, the United States Consulate in Nassau reported on June 6, 1961.



Brazil

WHALE AND FISH MEAL SUPPLY AND DISTRIBUTION, 1959-1961:

The forecast of Brazil's supply of whale and fish meal in 1961 shows a 45.5-percent

Item	1961 ^{1/}	1960 ^{2/}	1959
	(Metric Tons)		
Opening Stocks, Jan. 1 . . .	1,000	1,000	200
Production	15,000	10,000	3/4,867
Imports	-	-	-
Total Supply	16,000	11,000	5,067
Exports	-	-	-
Domestic Utilization	15,000	10,000	4,067
Ending Stocks, Dec. 31 . . .	1,000	1,000	1,000
1/Forecast.			
2/Estimate.			
3/Final Estimate.			

increase over 1960 and a 215.8-percent increase over 1959, entirely due to an expected increase in domestic production. It is estimated that domestic production should increase significantly--from 4,867 metric tons in 1959 to 15,000 tons in 1961. (United States Foreign Agricultural Service Report, Sao Paulo, May 19, 1961.)

Note: See Commercial Fisheries Review, Jan. 1961 p. 54.

WHALE AND FISH OIL SUPPLY AND DISTRIBUTION, 1959-1961:

A forecast of Brazil's supply of inedible whale and fish oils in 1961 shows that it will be more than 6 times greater than in 1959 and up 69.8 percent from 1960. Domestic utilization is expected to keep pace with increased production (see table).

Item	1961 ^{1/}	1960 ^{2/}	1959
	(Metric Tons)		
Opening Stocks, Jan. 1 . . .	1,000	300	300
Production	8,000	5,000	3/1,152
Imports	-	-	-
Total Supply	9,000	5,300	1,452
Exports	-	-	-
Domestic Utilization	7,500	4,300	1,152
Ending Stocks, Dec. 31 . . .	1,500	1,000	300
1/Forecast.			
2/Estimate.			
3/Final Estimate.			

Brazil's only edible oil of importance is cod-liver oil and the entire supply is imported. However, with the expected increase in the domestic production of whale and fish oil, imports of cod-liver oil declined from 1,218 metric tons in 1959 to 150 tons in 1960, and are expected to drop to 100 tons in 1961. During the first 10 months of 1960, Norway was the main supplier of edible crude cod-liver oil, while only a negligible amount was received from the United States. (United States Foreign Agricultural Service Report, Sao Paulo, May 19, 1961.)

Note: See Commercial Fisheries Review, Jan. 1961 p. 54.



British Honduras

FISHERY PRODUCTS EXPORTS, 1959 and 1960:

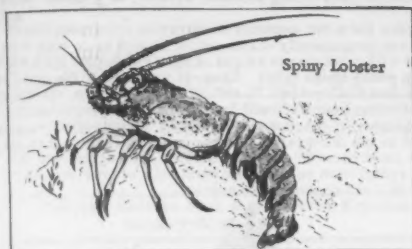
British Honduras exports of fishery products during 1960 totaled 497,467 pounds, valued at US\$213,824. As compared with 1959, exports in 1960 were lower by 4.9 percent in quantity, but were up about 14.0 percent in value. In 1960, exports of spiny lobsters (whole and tails) of 363,720 pounds were down about 8.8 percent from the 398,043 pounds exported in 1959. However, the value (\$193,304) of spiny lobster exports in 1960

Product	1960		1959	
	Qty. Lbs.	Value US\$	Qty. Lbs.	Value US\$
Fresh, frozen or live fish:				
Total exports	103,479	14,295	80,479	12,737
Exports to U.S.	85,403	10,011	49,680	9,482
Salted, dried fish, etc.				
Total exports	24,855	2,573	32,638	3,192
Exports to U.S.	-	-	-	-
Spiny lobster, whole & tails:				
Total exports	363,720	193,304	398,043	167,685
Exports to U.S.	345,198	189,925	368,920	162,411
Tortoise shell:				
Total exports	1,608	3,250	1,507	3,101
Exports to U.S.	-	-	-	-
Unclassified:				
Total exports	3,805	402	10,582	892
Exports to U.S.	520	143	400	182
Total all fishery products:				
Total exports	497,467	213,824	523,249	187,607
Exports to U.S.	411,121	200,079	419,000	172,075

was higher by 15.3 percent as compared with the 1959 value (\$167,685).

Exports of fish and shellfish to the United States from British Honduras in 1960 accounted for 82.6 percent of the volume and 93.6 percent of the value of total fishery exports. Spiny lobster exports in 1960 to the United States were down 6.4 percent in quantity due to higher prices on the United States

British Honduras (Contd.):



market and possibly to an increase in the amount of spiny lobsters shipped as tails rather than whole.



Canada

ARCTIC FISHERIES SURVEY:

The Yukon Territory cannot develop a profitable sea fishery at the present time because there are not enough marketable fish in adjacent waters, according to a survey made in the summer of 1960 by the Arctic Unit of the Fisheries Research Board of Canada.

Caplin, which are closely related to smelt, and which are the chief food of Newfoundland cod from early spring to midsummer, have recently appeared at and in the vicinity of Herschel Island off the Yukon coast. The only Yukon coastline is the territory's northern boundary, where it looks out on Mackenzie Bay of the Arctic Ocean. This strip is about as long as New Brunswick's coastline on the Gulf of St. Lawrence. Herschel, roughly the area of Grand Manan in Fundy, is the only sizable island close to this coast. It was the base last summer for experimental fishing by the Research Board's motor vessel *Salvelinus*, to find out whether this area would support a commercial fishery. The answer was that it will not. The area is covered with ice until late July. Beginning on July 23, 1960, bottom trawling and drift gill-netting revealed no abundance of marketable fish, although beach seining on the island proved that large quantities of caplin were still present there.

The Arctic Unit, which has its headquarters in Montreal, made this investigation in pursuit of its current study of the commercial potentiality of fish stocks throughout the western Arctic.

At the same time other Research Board vessels in the eastern Arctic were continuing the Unit's long-term study of stocks of Arctic char, the fish so highly rated by gourmets, who described it as something between sea salmon and brook trout. Two surveys were made in fresh-water areas on the south coast of Baffin Island and one on the east coast of Hudson Bay. Char were scarce in the latter area and although present in the Baffin waters were not in sufficient quantities to support commercial fishing. A few other fresh-water fish were taken also, nine-spined stickleback in the Baffin areas and sea-run brook trout, whitefish, and ciscoes in the waters running into eastern Hudson Bay. (Canadian Trade News, April 1961.)

FISHING VESSEL REPORTS
RECORD SCALLOP TRIP:

A record scallop trip of 62,571 pounds of meats was reported early this year, when the Canadian scallop dragger Barbara Joe unloaded at Lunenburg, Nova Scotia.

Scallop fishing is relatively new to Canadians because it was scarcely more than a decade ago that Canadian draggers began to exploit the rich scallop fishing grounds off the Nova Scotia coast. Inshore scallop fishing such as that carried out in the heavy tidal waters of the Bay of Fundy is an important part of the fishing picture, but for vigorous expansion the deep-sea scallop is a leader in new developments contributing to the growth of the Canadian fishing industry.

Rich Georges Bank--a big area of water sprawling in the Atlantic about 160 miles southwest of Yarmouth, Nova Scotia--is an important scallop fishing area. There are other scallop grounds in the Canadian Atlantic, but it is Georges Bank where the bulk of the production is found. Each year sees more vessels on Georges Bank, now being fished heavily by both Canadian and United States draggers.

Last year scallops returned nearly C\$2 million to Canadian fishermen and vessel owners in the Maritime Provinces.

So important is the scallop fishery that Canada and the United States are carrying out joint investigations as to how the scallop lives and reacts to its environment.

Canada (Contd.):

In good fishing weather it is an around-the-clock operation for scallop fishermen. There is plenty of work from the time the dredges are hauled on deck, the scallops shucked, washed, placed in bags, and iced in the holds.

Only the white column of muscle, that holds together the two halves of the shell and operates the opening-and-shutting movement that gives the shellfish its jet propulsion, is utilized.

FREEZE-DRYING EXPERIMENTS ON FISH CONTINUED:

Canadian experiments on vacuum freeze-drying of cod steaks and fillets have so far been limited to drying fish slices of half-inch thickness. After cutting the frozen fish into steaks, fillets, or portions of this thickness, the fish were dried for 10 hours in a vacuum oven at 80° F. The finished product was white, porous, and of good appearance. It could be warehoused and distributed as readily as any other frozen fish. The housewife would need only to soak it in cold water for five minutes to give the appearance and texture of fresh fish.

Similar experiments are planned for 1961, using spiked plate-drying and radiant heating, and comparing results with other methods. Experiments will also be conducted with salt fish. If vacuum freeze-drying can be made commercially feasible in the salt fish industry, it may, to some extent at least, supersede the present plant method for certain products.

NEW FOOD LABEL LAW:

A new Canadian food label law now requires that the main panel of the package show the contents close to the name. General food labeling regulations under the Canadian Food and Drugs Act, amended on January 1, 1960, come into full force on January 1, 1962.

It is expected, notes the Canadian Department of National Health and Welfare, that all food labels in consumer packages will conform with the new regulations by the first of the new year. After that date, entry will be refused importations which do not meet the new labeling requirements. Manufacturers expecting to export food products into Canada should plan to conform to the new regulations.

It is now required that the main panel of a package of food carry the brand or trade name, if any, the common name of the food and a declaration of net contents in close proximity to the common name. Close proximity is defined as immedi-

ately above, below, to the right, or to the left of the common name without intervening printed, written, or graphic matter.

In order for a net contents declaration to be considered clearly and prominently displayed, it should be in bold-face type and with a minimum height of type related to the area of the main panel of the label. Thus, if the area of the main panel of the label is between 20 and 40 square inches, the declaration of net contents should be in bold-face type at least 1/8 inch in height. If fractions of an ounce, pound, or other unit are used in the declaration of net contents, each part of the fraction must meet this requirement. The regulations impose no restriction on the maximum size of type that may be used in a net contents declaration.



Ceylon

JAPANESE TO PROVIDE FISHERIES TRAINING CENTER:

Under the terms of the agreement worked out between Ceylon and Japan, Japan is sending eight technicians, headed by an employee of the Japanese Fishery Agency, to Ceylon on July 10, 1961, to open the fisheries training center at Negombo, Ceylon. The Center is scheduled to open on September 1. Japan will provide one training ship and contribute a total of 1.3 million rupees (US\$273,000) over a three-year period. In addition, Japan will train 20 Ceylonese every four months in the handling of fishing gear; instruct 10 Ceylonese for a one-year period in the operation and maintenance of marine engines, and offer instructions in general fishery problems. (Suisan Tsushin, June 22, 1961.)

JAPANESE-CEYLONESE JOINT FISHING VENTURE:

A Japanese fishing firm and a Ceylonese firm have completed negotiations on forming a joint company. The Japanese firm dispatched the tuna vessel No. 1 Shizuoka Maru, 87 gross tons, to Ceylon on June 20, 1961. By agreement, the vessel will be used to train Ceylonese fishermen in fishing techniques, and all catches will be delivered to the Ceylonese firm for a period of one year.

The vessel will make 13 trips during the year, each trip to be about 20 days. Plans call for an additional 2 or 3 fishing vessels if the venture proves successful. (Suisan Keizai Shimbun, June 23, 1961.)



Chile

FISH MEAL AND OIL

EXPORTS AND PRICES, JAN.-MAY 1961:

Official trade statistics of the Banco Central report exports of fish meal and fish oil for the month of April and the first quarter of 1961 (table 1).

Table 1 - Chilean Fish Meal and Oil Exports
January-April 1961

Destination	Quantity	Value	Unit Price	
	Metric Tons	US\$ 1,000	US\$ per Metric Ton	US\$ per Short Ton
Fish Meal				
April 1961:				
United States	1,182.7	82.9	70.09	63.59
Netherlands	687.6	48.0	69.81	63.33
France	397.3	29.6	74.50	67.59
Venezuela	317.8	23.6	74.26	67.37
Germany	197.5	14.0	70.89	64.31
April total	2,762.9	198.1	71.18	64.57
Jan.-Mar. 1961:				
United States	2,316.4	152.5	65.83	59.72
Netherlands	2,708.5	184.2	68.82	59.71
France	534.3	35.4	66.25	60.10
Germany	344.8	23.0	66.71	60.52
Venezuela	296.5	21.4	72.18	65.48
Sweden	198.6	13.3	66.97	60.76
Brazil	198.6	13.1	65.96	59.84
Bolivia	29.6	2.2	74.32	67.42
Jan.-Mar. total . .	6,717.3	445.1	66.26	60.11
Fish Oil 1/				
April 1961:				
Germany	440.0	49.5	112.50	102.06
Jan.-Mar. 1961:				
Germany	698.1	73.8	105.72	95.91

1/Excludes exports of 6.7 metric tons (value US\$8,500) to the United States which is believed to be a special trade fish oil by fish oil factories.

The trade journal of the Central Chamber of Commerce *El Informativo* publishes shipments on basis of manifests (table 2). Data compiled from that source does not fully agree with official trade figures but is the only information available on a more current basis (as far as values are concerned, the difference is believed to be in the listing of both c.i.f. and f.o.b. values in accordance with the terms of the sale.)

All shipments continue to move out of the fish meal plants located in Arica and Iquique which operate with the 30-20 percent subsidy. Fish meal plants along with other manufacturing industries located in the distressed northern area of Chile receive this subsidy on products manufactured of natural resources and exported. The subsidy amounts to 30 percent of the cost of raw material used and 20 percent of the f.o.b. price of the finished product exported. The subsidy fund for Arica is supported by a tax on imports entering Arica and for Iquique by local sales taxes. The primary purpose of the subsidy is to encourage private investment capital to assist in the economic development of this northern region.

The one shipment of fish oil in April to the United States was a special lot of "merluza" oil obtained from the Instituto de Biología de Vina del Mar, a department of the University of Chile. (United States Embassy, Santiago, June 5, 1961.)

Table 2 - Chilean Exports of Fish Meal and Oil,
March-May 1961

Destination	Quantity	Value	Unit Price	
	Metric Tons	US\$ 1,000	US\$1 per Metric Ton	US\$1 per Short Ton
Fish Meal				
March 1961:				
United States	288.0	23.8	79.81	72.40
Venezuela	621.6	45.0	72.33	65.62
Netherlands	498.6	45.7	91.65	83.14
France	198.6	14.8	74.52	67.60
Germany	197.5	13.6	68.86	62.47
March total	1,814.3	142.9	78.73	71.42
April 1961: 1/				
United States	1,354.6	98.0	72.34	65.63
Netherlands	398.6	33.1	83.04	75.33
Germany	497.5	39.5	79.35	71.99
April total	2,250.7	170.6	75.78	68.75
May 1961:				
United States	397.2	36.4	91.64	83.14
Netherlands	500.0	41.2	82.48	74.83
May total	897.2	77.6	86.54	78.51
Fish Oil				
March 1961: 2/				
Germany	146.0	18.8	129.00	117.03
"	N	27.1	N	N
March total	N	45.9	N	N
April 1961: 2/				
Germany	N	29.1	N	N
"	100.2	14.3	142.75	129.50
April total	N	43.4	N	N
May 1961:				
Germany	300.0	43.3	144.33	130.94
Norway	59.2	6.1	103.80	94.17
May total	359.2	49.4	137.66	124.89

Source: *El Informativo*, official publication of Central Chamber of Commerce of Chile and Santiago.

1/Note that these data are substantially different from data reported in table 1.

2/Incomplete

IMPLEMENTING REGULATIONS ISSUED FOR FISHERIES LAW:

By Decree No. 133 dated February 9 and published March 29 in the *Diario Oficial*, the Chilean Government establishes the controlling regulations for the new fisheries law issued as DFL No. 266, April 6, 1961. Law No. 208 of July 21, 1953, however, is not superseded by this legislation and remains in force for the industries which do not wish to qualify under DFL No. 266. Although the provisions are quite similar, No. 208 is applicable to both natural and juridical persons while concessions offered under DFL No. 266 are offered to juridical persons only.

Decree No. 133 classifies the fisheries industry into three groups: fishing industries, auxiliary fishing industries, and complementary fishing industries. Fishing industries include those companies engaged in the fishing, hunting, and capture of marine life.

Chile (Contd.):

Processing and canning plants are classed as auxiliary fishing industries. Enterprises engaged in the construction and repair of industrial and commercial fishing boats or the manufacture or construction of fishing equipment for own use are classed as complementary fishing industries.



To qualify for the privileges and concessions specified in DFL No. 266, all fishing industries must be registered on the Rol de Industrias Pesqueras, Anexas y Complementarias in the Office of Fisheries and Hunting, Ministry of Agriculture. Those already entered in the Fisheries Register may reregister on the Rol and qualify. With registration the juridical entity may request issuance of the supreme decree by the Ministry of Agriculture which entitles it to all privileges and concessions specified by DFL No. 266.

On presentation of this public document such entities may import free of all duties, taxes, and charges including consular fees and deposits, products specified in Article 2, paragraph (i) of DFL No. 266, i.e. fishing

boats of over 10 metric tons, machinery used exclusively by the fishing industry, nets, boats, refrigerated trucks, and trailers completely equipped, marine motors and winches, and machinery parts and accessories.

A certificate from the Ministry of Economy certifying that the product to be imported is not produced in Chile in adequate quantity or quality or at a reasonable price must be presented to the Central Bank, together with the recommendation of the Department of Agriculture and Fisheries, to obtain free import of merchandise specified in Article 2, paragraph (j) of Law No. 266. Included in the group are petroleum fuels and lubricants excluding gasoline; refrigeration units, machinery and parts and accessories; display refrigerator units, equipment and machinery for sale of seafood, refrigerators or freezers; tinplate with a protective varnish with or without lithograph for re-exportation of canned fish products; tackle, lines or ropes; steel cables, galvanized or not; navigation and fishing apparatus, implements and gear. The Department of Industry and Commerce of the Ministry of Economy will consider production inadequate when it is insufficient to cover normal domestic requirements, quality inadequate when the Chilean product is noticeably inferior to imported goods, and price unreasonable when it exceeds the c.i.f. value of the imported product by 20 percent.

The 75-percent capitalization required by Article 4 of DFL No. 266 of profits will be applied on the profit shown on the income tax statement less 8 percent as interest on paid-in capital and accumulated reserves, 2 percent of capital and reserves for contingencies, and up to 20 percent of the social capital for salaries of no more than 3 administrative members of the enterprise provided it is not an anonymous society.

This 75-percent portion must be invested in (1) consolidation and development of the company through an increase in physical assets, including stocks, increase in credits for sales abroad, or reduction of debts, (2) expansion into other fields of fisheries industry, and/or (3) construction of workers' housing. The 75-percent reserve may be accumulated for a period up to 3 years but the Office of Internal Revenue, which has the responsibility of ensuring that capitalization and investment are made in accordance with DFL No. 266, may authorize an extension of the three-year period.

Chile (Contd.):

A fishing cooperative will be granted privileges and concessions authorized by DFL No. 266 provided its application is accepted by the Department of Agriculture and Fisheries and the supreme decree is issued.

Goods imported free of duty under DFL No. 266 may be transferred within 5 years of entry to another entity entitled to free entry or upon payment of applicable import taxes and/or duties. After 5 years the Department of Agriculture and Fisheries may waive payment of import charges. A "finished product" is understood to be that which does not require further industrial processing for use. In case of doubt the final determinations shall be made by the Department of Agriculture and Fisheries.

The decree granting the right to concessions and privileges of DFL No. 266 will be invalidated only by the President on basis of fully documented proof of infringements referred to in Article 8 of DFL No. 266.

Most companies now operating under Law No. 208 of July 23 are expected to reregister in order to qualify for the privileges and concessions of DFL No. 266. (United States Embassy, Santiago, May 31, 1961.)



Costa Rica

EXPORTS OF SEA TURTLES ARE LEGAL EXCEPT FOR THOSE CAUGHT IN NURSERY AREA:

The Costa Rican Ministry of Agriculture and Livestock states that exports of sea turtles taken on the beaches or offshore (mostly males or females that had already deposited their eggs) are legal, with the exception of those taken from Laguna del Tortuguero beaches, which is an important nursery area and essential to the maintenance of the resource in the Caribbean.

Laguna del Tortuguero is one of the few known sites where female turtles come in large numbers to lay eggs. Hunters would go up and down the beach tipping turtles over until they could be moved to pens prior to export. But most of the turtles harvested were females which were not given the opportunity to deposit their eggs. Uncontrolled harvesting of the female turtles in the past forced

the authorities to close that area several years ago and also prohibit the sales of turtle eggs in the local market.

At the present time there are no exporters of turtles in Costa Rica. It is believed that a recently-formed fishermen's cooperative (Asociacion Pesquera de Puerto Limon) may in time be able to assume the role of both producer and exporter. The Government of Costa Rica would welcome the encouragement of exports of sea turtles, provided that the resource is protected from overexploitation. (United States Embassy, San Jose, dispatch dated June 30, 1961.)



Denmark

FISH MEAL AND SOLUBLES PRICES, JUNE 4-10, 1961:

During the week ending June 10, 1961, export prices for Danish herring meal were quoted at 920 kroner a metric ton (US\$121.01 a short ton) f.o.b. Esbjerg. Prices for lower protein fish meal were 860 kroner a metric ton (\$113.12 a short ton).

A large order of fish solubles brought 750 kroner a metric ton (\$98.65 a short ton). This price represents a substantial increase from an early May price of about \$64.46 a short ton. (United States Embassy, Copenhagen, June 27, 1961.)



El Salvador

NEW TAX IMPOSED ON SHRIMP EXPORTS:

The Civil-Military Directorate of El Salvador signed a decree (No. 154) on June 7, 1961, imposing an export duty of 15 centavos (6 U. S. cents) for each net 453 grams (one pound) of shrimp in any form exported from El Salvador.

A plan to tax shrimp exports was studied by the Government, reached the drafting stage in October, and almost became law on March 17. The present law is believed to be less objectionable to the industry than the previous draft, which provided for ad valorem taxes on all shrimp exports, based on c.i.f. prices, with rates ranging from 10 percent on shrimp sold at 50 U. S. cents per pound

El Salvador (Contd.):

or under, up to 20 percent on sales at \$1.00 a pound.

Decree No. 154, published in the Diario Oficial on June 14, 1961, justifies the law stating that the State has made a heavy investment in fisheries investigations which the industry is now enjoying, that fishery resources are the property of the State, and that the shrimp industry has now reached a level of development that enables it to repay the State for its investment. The law provides for fines ranging from 25 to 25,000 colones (\$10 to \$10,000), with the possibility of suspension or cancellation of the fishing license.

The shrimp industry, which is presently making a study of the new law, intends formally to request the Directorate to recon-

An industry spokesman further stated to the press that it was a most inopportune time for such a duty since the catch in May had dropped off due to the rainy season, off 50 percent from the April catch of 15,000 pounds. As of June, shrimp catches picked up and 65 of the 72 shrimp vessels were active. (United States Embassy, San Salvador, dispatch dated July 5, 1961.)



German Federal Republic

FISH MEAL PRICES,
JUNE 7, 1961:

Prices reported at Hamburg Commodity Exchange as of June 7, 1961, for fish meal delivered ex-Hamburg warehouse, or c. & f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton	US\$/Short Ton
German fish meal	50-55	prompt/June	540	122.47
" " " "	55-60	" "	555	125.87
" " " "	60-65	" "	575	130.41
" " " " std. brands	60-65	June	605	137.21
Icelandic cod meal	65-70	June	665	150.82
Peruvian fish meal	65-70	July-Sept.	575	130.41
" " " "	65-70	"	557.50	126.45
South African fish meal . . .	65-70	August	597.50	135.52
Angola fish meal	65-70	June	600	136.08

Note: Values converted at rate of 4.0 deutsche marks equal US\$1.

sider the decree, according to press reports. Eleven of the 14 shrimp companies have formed a Camara Pesquera de El Salvador (Fisheries Chamber). The industry is expected to object to the new law on two grounds: that the newly expanded companies have not completed payments on newly-purchased equipment, and are therefore in no position to absorb the tax, and that the tax is too high thus impeding the development of the smaller companies.

As compared with May 7, 1961, fish-meal prices on the Hamburg exchange on June 7, 1961, continued the upward trend for both domestic and Peruvian fish meal. (United States Consulate, Bremen, June 12, 1961.)

* * * * *

FISH MEAL PRICES, JULY 5, 1961:

Prices reported at Hamburg Commodity Exchange as of July 5, 1961, for fish meal delivered ex-Hamburg warehouse, or c. & f. West German sea port were as follows:

Type of Fish Meal	Protein Content (%)	Delivery	DM/Metric Ton	US\$/Short Ton
German fish meal	50-55	loco/ prompt/July	540	122.47
" " " " " " " "	55-60	" " "	550	124.74
" " " " " " " "	60-65	" " "	580	131.54
" " " " std. brands	60-65	July	610	138.35
Peruvian fish meal	65-70	loco	540	122.47
" " " " " " " "	65-70	Aug.-Oct. 1961	570	129.28
" " " " " " " "	65-70	Nov.-Dec. 1961	575	130.41
South African fish meal . . .	65-70	July	590	133.81
" " " " " " " "	65-70	AUG. 1961	595	134.95
Angola fish meal	65-70	loco/July	607.50	137.79

Note: (1) Values converted at rate of 4.0 deutsche marks equal US\$1.
(2) "Loco" means where and as it is at the time of sale, and all subsequent expenses to be at buyer's account.

German Federal Republic (Contd.):

Fish-meal prices on the Hamburg exchange on July 5, 1961, averaged about the same as on June 7, 1961. (United States Consulate, Bremen, July 11, 1961.)



Ghana

BANS IMPORTS OF PORTUGUESE CANNED FISH:

The Ghana Government has revoked the application to Portugal and the Portuguese monetary area of all open general import licenses, effective June 1, 1961. The effect of this is to require a specific license for imports of goods consigned from Portuguese territory regardless of origin and of Portuguese goods regardless of point of shipment.

According to Notice to Importers No. 152 dated June 1, 1961, the Ministry of Trade will entertain applications for specific licenses only for pre-freezing Portuguese transactions or for non-Portuguese goods merely transhipped via Portuguese territory, and there is no guarantee of a license even in those cases.

The major Portuguese product imported by Ghana is canned fish, particularly sardines and pilchards. Another traditional source of fish was South Africa, the only other country against which Ghana has imposed an import embargo.

Imports of canned sardines and pilchards from South Africa and Portugal in 1960 totaled £G770,000 (about US\$2.1 million) or about 40 percent of the total, despite the fact that the embargo against South Africa was imposed during the year. (United States Embassy, Accra, June 21, 1961.)

PROGRESS REPORTED IN MODERNIZING FISHING INDUSTRY:

The Government of Ghana, depending on fish as the mainstay in its national diet, has made considerable progress in its efforts to modernize its fishing fleet. Deep-water ports and processing plants are under construction or being completed, and the country is making a concerted effort to exploit its vast marine potential. Progress in fisheries devel-

opment is reflected in the newly-constructed harbors at Tema and Elmina, building new boats for fishermen, and Government offshore exploratory fishing for tuna.

One of Ghana's principal concerns in properly implementing its fishing mechanization and modernization program has been to devise marketing and distribution systems assuring availability of fish in towns and villages in the hinterlands. A fish marketing specialist of the Food and Agriculture Organization has been assisting Ghana in this endeavor, recommending systems for wholesaling and retailing fish in Ghana's interior.

Fish marketing traditionally has depended on women fishmongers who deal directly with the fishermen and completely control the trade. The FAO expert has helped the Government set up a pilot market at Takoradi where the market buys the fish from the fishermen for re-sale, at a negotiated price, to the women traders. In return, the traders who have been able to handle only small amounts of fish in the past are provided with ice and cold-storage facilities to help them extend their business.

The expert is also assisting Ghana on another project, drawing up the final plans for a new market to be located at the recently-completed million-dollar fishing harbor at Tema. The latter port will serve as a distribution point for increased catches landed at Tema and Elmina.

Fish flour, long advocated by FAO experts for human consumption, has found a growing market in Ghana. A pilot fish-flour plant has been in operation for some time and now a plant is being built to produce it on a commercial scale. This fish flour, which can be kept sterile up to two years in waterproof bags and can be easily carried by bicycle, bullock, or even as a headload, will be sent into the interior of Ghana where there is a lack of protein and a large potential market for the fish flour. (Commercial Outboarder, Summer 1961.)

Note: See Commercial Fisheries Review, September 1960 p. 49.



Iceland

OCEAN PERCH FISHING AND MARKETING PROBLEMS:

Ocean perch or redfish in the Atlantic have given Icelanders good catches in recent years, but they have found that production is unpredictable.

In 1958 Icelandic trawlers made bumper catches of ocean perch on Greenland and Newfoundland banks. Because of that some trawler companies decided to build several big trawlers, about 1,000 tons, which would quickly have paid for themselves if catches had continued.

But no sooner had these new trawlers been delivered than the ocean perch vanished from the banks and the big trawlers made some disappointing trips returning with only 50 or 80 metric tons after three-week trips. It became difficult to find any paying catch for these trawlers and they lay unused for many months.

In early May 1961, a few Icelandic trawlers on Newfoundland banks again found ocean perch but only for a short time. But again the ocean perch catch dropped off.

A marketing problem is also confronting Iceland since as of June 1961 no new trade agreement has been made with the Soviet Union although such should normally be concluded at the beginning of the year. Talks have been going on at diplomatic levels but without result.

Since the beginning of this year there has been practically no export of frozen fish to Russia, while Icelanders have continued to receive fuel shipments from the Black Sea. This has now resulted in a 200 million kronur debt to the Russians (US\$5.2 million).

Russians trade on basis of world market prices. When fish sales to Russia suddenly increased in 1953 (because of the landing ban in Britain), the Russians paid for ocean perch a price comparable to the world market price. But since then they have not been ready to increase the price although market prices of ocean perch have increased about 30 percent in Western Germany and the United States.

Icelanders, therefore, have for a time been selling the fish under the world price to Russia. They maintain they were able to do so when catches were good, but since catches have decreased they cannot do so without losses.

However, Icelanders feel less dependent upon the Russian market since the dispute with Britain seems to be solved, and the markets in Western Europe and the United States are expanding. They also suspect that the producing cost in the Russian fisheries is much higher, and may be many times higher than the purchasing price of Icelandic fish.

Icelanders would not like to lose the Russian market, mainly because it is very big and sometimes has taken considerable quantities, especially in years of bumper catches. But they have found that the Russians are strong negotiators who try to use their big buying power to get goods cheaper. (*The Fishing News*, June 9, 1961.)



India

INCREASED FISH PRODUCTION NEEDED TO SUPPLY PROTEIN FOOD:

India, with 438,000,000 inhabitants, has suffered severe food shortages for many

years despite its 3,500 mile coastline, and its immense fishery reserves which could be exploited to provide an abundance of fish.

Producing slightly more than one million tons of fish per year, or approximately one forty-fifth of the world's total yearly production, India's fish consumption is only 0.9 pound per capita, one of the lowest in the world.



Fig. 1 - Spear fishing in Andaman Islands from a hollow-tree canoe is an outmoded fishing method still used in India.

In addition, India requires 750,000 fishermen to harvest its comparatively meager catch. Norway, a country of 3,500,000 inhabitants and a highly mechanized fishing fleet employing 85,000 fishermen, produces more than India. Norway has an annual catch that varies from 1.2 to 1.8 million metric tons despite the fact that its fisheries are highly seasonal.

However, despite the various problems suffered in its fishing industry, India has shown a slow but definite growth in its attempt to increase fishing production. It is expected that by 1966 the increase will be 50 percent above the 1956 level, but there are problems still to be overcome.

India's fishing industry has been handicapped mainly because of outmoded fishing techniques handed down from one generation to another. Fishermen are dependent on small, primitive craft propelled by sail and oar and are restricted to limited fishing areas. Their yield is necessarily low due to the fact that

India (Contd.):

they are constantly fishing the same waters which have been thoroughly exploited.

In addition to being undermechanized, Indian fishermen are further handicapped by problems of geographical dispersion; their inadequacy to obtain credit; a shortage of storage plants, preservation, transport, and marketing facilities; and dependence on middlemen.



Fig. 2 - An FAO prototype powered surf boat going through the surf on the Indian coast. This is meant to replace the catamarans used along the surfbeaten coast where there are no harbors.

The establishment of either government- or private-sponsored fishing cooperatives would free fishermen of their economic bonds; provide them with credit to buy new boats, engines, tackle, and other supplies; will help them to market their catch at a fair market price. Cooperatives (which are in successful operation in many countries) could also provide credit to fishermen, permitting them to mechanize their craft, with the investment paid off through increased production.

The answer to India's problem of how to provide more vitally-required food of a specific type that contains a high animal protein yield definitely lies in fish foods. India's coastal waters (particularly on the west coast where the continental shelf extends about 100 miles offshore) and her inland waters with their great variety of fish, provide ideal conditions to augment fishing production.

The Indian Government's second Five-Year Plan now in effect calls for the improvement in fishing methods, mechanization

of boats, the availability of proper fishing gear, the introduction of new fish farming methods, and the improvement of storage, transportation, and marketing facilities. It has been reported, however, that the program, aimed at supplying more food and helping to raise the social and economic welfare of the fishing population, has fallen short of its projected production goal.

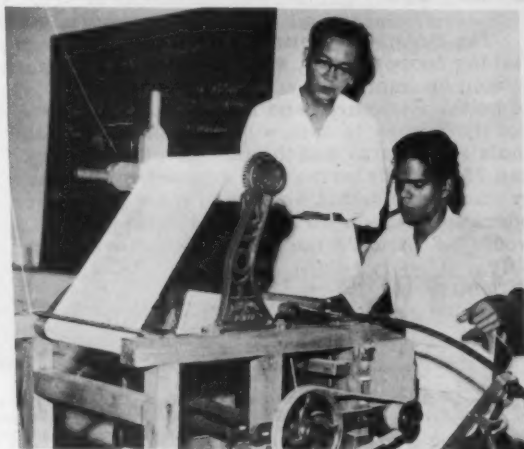


Fig. 3 - A trainee at the Fishing Gear Research Station in Cochín learns to use a net-making machine under the instruction of a fishing gear technologist.

The main reasons given for India's failure to reach this goal to increase production (except in isolated areas) is reported to lie in (1) not being able to provide vast sums of money required for investment in heavy mechanization equipment; (2) failure to eliminate the middleman; and (3) the fisherman's role as an independent businessman is difficult.

Regarding the availability of funds to invest in the purchase of heavy equipment to mechanize large fishing vessels, it has been suggested by the Food and Agriculture Organization (FAO) that production might be increased at a faster pace by commencing with the mechanization of individual fishermen. The success of this approach can be illustrated by large increases in production in Mexico, Salvador, Nicaragua, Jamaica, Puerto Rico, Ceylon, Malaya, Sarawak, Uganda, Angola, Senegal, Nigeria, and many countries where outboard motors have been employed to propel small fishing craft. Outboard motors have also been used for towing 20 to 30 other boats to and from the fishing grounds.

India (Contd.):

A small-craft mechanization program rather than long-range investment in heavy fishing equipment would obtain immediate increases in production by allowing fishermen to devote more time to their trade; to extend their radius of operation into new and more productive banks, presently out of reach of oar and sail, and to return to market more quickly.

The FAO is assisting India to establish fishing cooperatives, and also training fishermen on improved techniques, and the use of better equipment and marketing practices, but their work is naturally limited due to India's vast size and the fact that the country has 750,000 fishermen. A stepped-up program for the establishment of many pilot cooperatives which would expand with time, would help India's fishing industry considerably. (*Commercial Outboarder*, Vol. 2, No. 2, Summer 1961.)



Italy

IMPORTS AND EXPORTS OF MARINE OILS, 1959-60:

Italy's combined imports of cod-liver and marine oils increased from 8,903 metric tons in 1959 to 9,547 tons in 1960. Most of these oils were purchased from Australia, Norway, and the United States. But shipments from the United States decreased from 1,216 tons in 1959 to 202 tons in 1960.

Italy's Imports of Fish Oil and Cod-Liver Oil, 1959-1960		
Country	1960	1959
(Metric Tons)		
United States	202	1,216
Austria	-	430
Denmark	-	6
France	847	385
West Germany	164	149
Iceland	18	9
Norway	2,314	1,583
Netherlands	270	195
Portugal	930	693
United Kingdom	382	856
Sweden	35	-
Japan	9	80
Indonesia	214	-
Morocco	575	10
South Africa	105	85
Chile	46	30
Peru	374	337
Australia	2,153	2,606
New Zealand	891	197
Others	18	36
Total	9,547	8,903

Italy's exports of cod-liver and fish oil were negligible. In 1960, exports amounted to only 29 tons as compared to 146 tons in 1959. While in 1959 Italy shipped 75 tons to the United States, none were shipped in 1960. (*United States Foreign Agricultural Service Report*, Rome, May 17, 1961.)



Japan

COMMERCIAL DEEP-SEA FISHING AREAS CONSTANTLY CHANGING:

The fishing areas, especially those in off-shore areas, exploited by Japanese fisheries in the postwar period are constantly changing. The Japanese fishing industry has grown tremendously and has shifted in recent years from coastal to offshore and from offshore to deep-sea fishing operations. Today, she leads the world with catches averaging 6,192,000 metric tons a year, surpassing the Communist Chinese fishing target of 5,800,000 tons for 1960.



Fig. 1 - A big school of yellowtail herded into a net off Japan.

In order to conserve fishery resources and utilize them reasonably, it has been the desire of Japanese fishing circles to cooperate unreservedly with other fishing nations and to observe strictly all international fishing regulations. However, the Japanese feel that the principle of the open seas is now in jeopardy because of the strong claims put forward by some foreign fishing nations regarding fishing restrictions in the open seas in the name of "preservation of fishery resources."

To cope with this situation, Japan is striving to explore and to develop new fishing grounds, to conclude capital tie-up agree-

Japan (Contd.):

ments with foreign countries for the establishment of joint enterprises, and to export Japanese fishing know-how. Large fishing companies are also going into the field of processing marine products in addition to their established fishing operations in order to improve their business position.

The following is an outline of the changing Japanese fishing industry today.

Salmon Fishing in North Pacific: The most serious restrictions currently being placed on Japanese fishing in the open seas are those on salmon fishing in the Northern Pacific. Salmon fishing is presently restricted by the Japan-Soviet Fishery Treaty as well as the Japan-U. S.-Canada Fishery Treaty.

At the fifth Japan-Soviet fishery negotiations which were held in Tokyo from February 20, Japan's salmon quota for the 1961 season was set at 65,000 metric tons. As a result of past negotiations between the two countries, Japan's salmon quota in the restricted areas has been diminishing every year. The quota for last year was limited to 67,500 tons. Moreover, fishing in the Okhotsk Sea, which Japan considers clearly an open sea, has been entirely prohibited since January 1, 1959. Large areas are thus being designated every year as closed to Japanese fishing vessels, greatly reducing the sphere of Japan's fishing operations.

Under the Japan-U. S.-Canada Fishery Treaty, Japan is obliged to refrain from fishing in waters east of 175° west longitude until agreement among the three nations is reached on an accurate line of demarcation between salmon originating in American and Asian rivers. This provisional line (175° west longitude) has been the focal point of controversy at the annual fishery talks between the three nations. For example, in last year's talks the United States called for an extension of the provisional line by another 10 degrees west while the Japanese side was for maintenance of the status quo. The negotiations were broken off and the issue had to be carried over to this year.

Bottomfish Fishery in Bering Sea: In contrast to the diminishing salmon catches, hauls of fish in the Bering Sea, such as flatfish, cod, halibut, and other species of deep-sea fish, have increased in recent years. These types

of fish are used for the production of fish meal (animal feed), frozen fish, and fish oil. Thirteen fleets were in operation last year. This year 28 fleets are operating in that area. In the past, the operation of meal processing and refrigerator ships was not profitable, but the Japanese fishing industry became active in this field to offset the curtailment of operations caused by the serious restrictions on salmon fishing. Today it is thriving, thanks to efforts in exploring new fishing grounds, rationalizing the use of fishing vessels, and improving fishing as well as processing techniques.



Fig. 2 - Mothership operating in the Bering Sea bottomfish fishery with a fleet of trawlers. Mothership equipped to freeze and also manufacture fish meal and oil.

Mother-of-Pearl Shell Fishing in Arafura Sea: Japanese mother-of-pearl fishing in the Arafura Sea is limited to a fixed volume which is determined through provisional agreements concluded between the Japanese and Australian Governments every year prior to the opening of the mother-of-pearl fishing season. The initial agreement was concluded following the "Continental Shelf Declaration" announced by the Australian Government in 1953. The fishing grounds are also restricted to a certain area which is decided by the two countries. Japan was permitted to catch a total of 415 tons of mother-of-pearl shells last year, but the actual harvest was 385 tons. This figure compares poorly with the 960 tons a year caught up to the time of the Continental Shelf Declaration. Japan's harvest during prewar years averaged 4,000 tons annually.

Whaling in the Antarctic Ocean: Under regulations of the International Whaling Convention, the five whaling countries of the world were originally allowed to catch as many whales as they could within an annual quota of 15,000 blue-whale units applicable to all countries. This was the so-called Olympic formula under which Britain, Norway, the Netherlands, the Soviet Union, and Japan operated.

Japan (Contd.):

Japan generally led the four other countries in the number of whales caught, but a problem arose when Britain and Norway proposed that a whale quota should be fixed for each nation because of the increase in the Soviet whaling fleet. Then in 1959, Norway and the Netherlands withdrew from the convention, resulting in an indiscriminate hunting of whales. Norway, however, rejoined the convention last year and a conference was convened in February this year to deliberate on the problem of assigning quotas to each of the five nations. The result, however, was unsatisfactory and an over-all agreement was not reached.

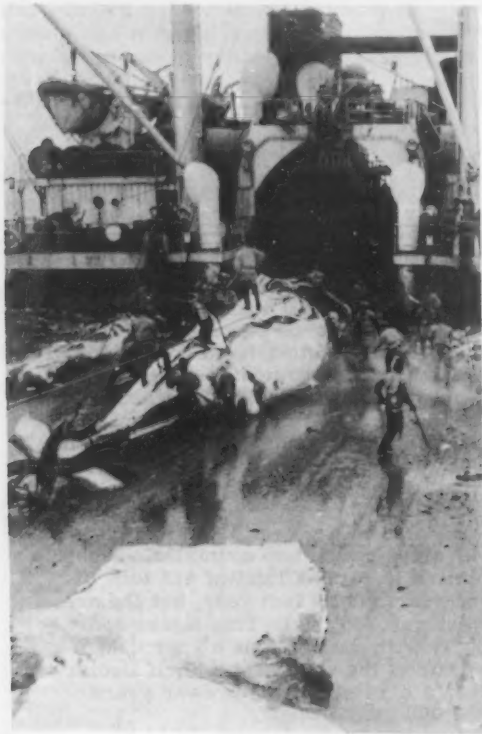


Fig. 3 - Cutting up a whale for processing aboard a Japanese whaling factoryship in the Antarctic.

It was however decided to allow the Soviet Union to catch 20 percent of the total quota, although the four other countries--Japan, Britain, the Netherlands, and Norway--have not reached an agreement on the allocation of the remaining 80 percent of the quota.

Drag-Net Fishing in the Yellow and East China Seas: Japanese fishing operations in the Yellow and East China Seas were placed under restrictions until June 1958, when the Japan-Communist China Fishery Agreement expired. Since then, fishing by Japanese boats in those areas is not bound by any agreement or restriction. However, Japan has informed Communist China that she would voluntarily abide by the regulations defined in the old fishery agreement between the two nations.

On the other hand, the Republic of Korea is still adhering to and enforcing the unilateral "Rhee Line" fishing restrictions announced in 1952 against Japan. In the fifth preliminary negotiation between Japan and the Republic of Korea which opened in October last year concerning fishing and the "Rhee Line," the problem of fishery resources had been discussed until the recent political change took place in the Republic of Korea.

Deep-Sea Tuna Fishing: Deep-sea tuna fishing by Japanese vessels is relatively unaffected by restrictions imposed by foreign countries. With the abolition of the so-called "MacArthur Line" in 1952, an increasing number of larger Japanese fishing vessels were constructed and equipped with modern fishing nets and gear. The marine catch for 1959 totaled 380,000 tons, more than twice the 1954 figure.

Japanese tuna vessels are now operating not only in the Southern Pacific and Indian Oceans but also in the Atlantic Ocean. Large areas of new tuna fishing grounds are being explored. Tuna fishing in the Atlantic Ocean was initiated in 1957. Two years later, in 1959, the total tuna haul from that area amounted to 50,800 tons, which was three times the catch in 1958. The tuna vessels have also increased in size from the 700-ton class to those of more than 1,000 tons.

One of the difficulties confronting Japanese tuna fishing is the Indonesian Government's declaration on inland waters made in 1957. According to the declaration, all waters within the area enclosed by a line encompassing the fringes of all the islands of Indonesia are considered inland seas of that country. Japanese tuna fishing is thus restricted greatly in that area. Other problems facing Japanese tuna fishing are the rationalization of the fishing approval system, maintenance of export prices, and the development of new export markets.

Fishing Companies Diversify: Since restrictions have been enforced on fishing op-

Japan (Contd.):

erations in the open seas, and since a business operation which depends solely on fishing has its limitations, the big fishing companies are now turning to new types of ventures. During the past 2 or 3 years, the major fishing firms have ventured into: canning of marine, agricultural, and meat products, the manufacturing of hams, sausages, frozen foodstuffs, mayonnaise, fruit juice, fish oil and fish meal; as well as the operation of mink farms. This is an effort to diversify operations. Some of the companies have even started chicken farms.

On the other hand, Japanese fishing ability and methods have drawn recognition from countries which are eager to develop their own marine resources. Contracts have been concluded in recent years for the establishment of joint companies, chartering of fishing vessels, marketing of fish, and other enterprises between Japanese companies and those of Venezuela, Brazil, Argentina, Mexico, India, Ceylon, Vietnam (South), Thailand, Borneo, Britain, and Israel. In every case, the venture has been conducted to the satisfaction and mutual benefit of the parties concerned. (Japan Report, June 15, 1961, Consulate General of Japan, New York.)

OPINION ON INTER-AMERICAN TROPICAL TUNA COMMISSION'S PROPOSAL TO REGULATE EASTERN PACIFIC YELLOWFIN TUNA FISHING:

The Japanese periodical Nippon Suisan Shimbun, July 3, 1961, stated that two developments in the United States bear watching. One concerns the proposal to regulate the catches of the Eastern Pacific tuna fishery made by the Director of the Inter-American Tropical Tuna Commission, and the other, the tuna meeting scheduled in Honolulu in August 1961.

The periodical pointed out that the Commission's Director was reported to have stated at a meeting held in Panama on February 24, 1961, that it will be necessary to consider adopting catch regulations this year for yellowfin tuna fishing in the Eastern Pacific. He was also reported to have stated before a Congressional Committee hearing that catch regulations may have to be established in the Eastern Pacific Ocean to prevent yellowfin tuna resources from becoming exhausted. His proposal was aimed at regu-

lating the catches of the United States' tuna fleet operating in the Eastern Pacific Ocean. However, the impact that such a regulation, if enacted, would have on Japan must be considered, inasmuch as a number of Japanese tuna long-liners have begun operations in the Eastern Pacific due to poor fishing elsewhere in the Pacific Ocean and in the Indian Ocean.

The Japanese Fishery Agency feels that the catches made by the long-liners are not large and should not create any problem from the standpoint of the resource; however, Japan cannot completely ignore any regulations established for the area and permit her vessels to operate freely in those waters.

Nippon Suisan Shimbun claimed that the problem of tuna resources would be discussed at the tuna meeting in Honolulu and it was not possible to see how this subject could be completely divorced from the subject of regulations being proposed by the Commission.

The periodical added that it was most difficult to ascertain precisely the extent of the tuna resources and it was unlikely that this problem would grow immediately into an international issue. However, Japan does conduct a tuna trade with the United States and this problem cannot be taken lightly. All these developments indicate a trend that the tuna problem is gradually but surely becoming an international issue.

EXPORT PRICES RAISED FOR CANNED TUNA IN BRINE:

All prices for Japanese canned lightmeat tuna in brine for export to the United States have been raised as follows:

Size & No. Cans per case	New Price (per case)	Old Price (per case)	Increase
<u>Lightmeat tuna (not including yellowfin)</u>			
No. 1, 24's	\$7.00	\$6.50	\$0.50
No. 2, 48's	7.30	6.80	0.50
No. 3, 48's	4.50	4.50	0.30
4-lbs., 6's	8.10	7.55	0.55
<u>Yellowfin</u>			
No. 1, 24's	\$7.15	\$6.50	\$0.65
No. 2, 48's	7.40	6.80	0.60
No. 3, 48's	4.55	4.20	0.35
4-lbs., 6's	8.25	7.55	0.70

The above prices were approved at a meeting held on June 21, 1961, by the Japan Export Canned Tuna Fisheries Association.

Japanese sources in the United States said that the above prices would become effective July 10, 1961.

Also, the Japan Canned Foods Exporters Association Tuna Standing Committee met June 21, 1961, to discuss sales poli-

Japan (Contd.):

cies for canned lightmeat tuna in brine for export to the United States. At this meeting the Committee approved the proposal submitted by packers to establish separate prices for canned lightmeat tuna produced from yellowfin and canned lightmeat tuna made from skipjack.

At the same time, the Committee agreed to accept the 50,000 cases (about 20,000 cases of skipjack and 30,000 cases of yellowfin) held in stock by the joint sales company at the packers' prices. Also, in selling the 50,000 cases, the Committee agreed to sell the yellowfin first and to sell the canned skipjack later, depending on market developments. (Suisan Taushin, June 23; Suisan Keizai Shimbun, June 22, 1961.)

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CANNED TUNA IN BRINE EXPORTS TO UNITED STATES, 1960:

Japanese exports of canned tuna in brine January-December 1960 amounted to: white meat, 986,853 standard cases (48 7-oz. cans) valued at \$9,309,180 f.o.b.; light meat, 1,057,709 standard cases valued at \$7,063,731 f.o.b., according to Japanese official export records.

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SEVENTH SALE TO UNITED STATES OF CANNED TUNA IN BRINE:

The seventh sale of canned tuna in brine for export to the United States was approved early in July by the Japan Canned Foods Exporters Association's Standing Tuna Sales Committee. The quantity approved was 150,000 cases, consisting of lightmeat (skipjack). Shipment was scheduled for July-August 1961.

Of the 50,000 cases of lightmeat on the sixth or last sale, some 20,000 cases of skipjack remained on hand with the exporters, and that amount also was included with the seventh sale. (Japanese periodical Suisan Keizai Shimbun, July 8, 1961.)

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CANNED TUNA IN OIL EXPORTS TO EUROPE:

Figures from the Japan Export Canned Tuna Fisheries Association show that a total of 135,728 cases of canned tuna in oil were approved for export in April 1961. Included are 43,912 cases of albacore, 10,667 cases of yellowfin, 62,897 cases of big-eyed, 4,865 cases of skipjack, and 13,387 cases of "flake-type" tuna. Principal markets (listed in order of importance) were West Germany, which led with 30,578 cases, Canada, Lebanon, Netherlands, and Kuwait. (Nippon Suisan Shimbun, June 30, 1961.)

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PRICES FOR EXPORTS OF FROZEN TUNA TO U. S.:

Reflecting the demand for raw tuna, the Japanese f.o.b. export market prices of frozen tuna for shipment to the United States has been advancing gradually since mid-May

1961, and in early June reached about US\$320 a short ton for albacore; and \$270-\$275 for yellowfin gilled and gutted, weighing 20-80 pounds.

Some 5,000 short tons of yellowfin tuna were exported in April and May, almost as much as planned, while albacore amounted to some 1,100 tons, considerably less than expected. (The Suisan Tsushin, June 13, 1961.)

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FISHERY AGENCY LICENSES 15 TUNA MOTHERSHIPS WITH PORTABLE CATCHER BOATS:

The Japanese Fishery Agency, on April 18, 1961, authorized two types of tuna mothership operations: (1) tuna motherships employing regular catcher vessels; and (2) tuna motherships fishing with portable catcher boats. Subsequently, the Japanese fishing companies, planning to operate tuna motherships of the latter type, formed an association called Portable-Vessel-Carrying Mothership Association. One of the primary functions of the Association is to arrange for the purchase of vessel rights for the purpose of constructing portable boats under the replacement system established by the Fishery Agency.

At the present, the Association consists of 16 member firms. Applications submitted by these firms to engage in tuna fishing, using portable boats, total approximately 30. Of these, the Fishery Agency as of June 1961 has licensed 11 firms to operate a total of 15 motherships. As far as can be ascertained, it appears that each mothership will be carrying only one portable catcher vessel. (Nippon Suisan Shimbun, June 28; Shin Suisan Shimbun Sokuho, July 4, 1961.)

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FISHERY AGENCY TO CONSOLIDATE TUNA RESEARCH:

The Japanese Fishery Agency is now studying plans to consolidate all tuna research beginning in 1962, and is planning to ask for a small budget in 1962 to get the program started.

Tuna research is now being conducted at several research institutions and although important they only present a fragmentary picture of the over-all tuna problem. The Fishery Agency hopes to consolidate all work done on tuna so that effective use can be made of information collected. The collection of

Japan (Contd.):

data would be assigned to prefectural research vessels and training vessels belonging to fisheries high schools, and the data collected would be processed at a central unit.

Tuna research being conducted at the Nankai Regional Fisheries Research Laboratory is considered to be of good quality, and one objective of the program will be to increase the production of good-quality research. (Suisan Keizai Shimbun, June 28, 1961.)

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CONTROL OF ATLANTIC OCEAN TUNA FLEET BY EXPORTERS ASSOCIATION PROPOSED:

The Japanese Fishery Agency is considering turning over control of the Japanese Atlantic tuna fleet to the Export Frozen Tuna Fisheries Association. The Association would regulate the operations of the Atlantic tuna fleet and the landing of Atlantic Ocean tuna. The Fishery Agency is also reported to be considering licensing all tuna vessels in the Atlantic Ocean as "commercial" fishing vessels and not as "experimental" fishing vessels, as has been the practice in the past. The purpose of the change would be to simplify the management of the Atlantic tuna fishery and to vest control in a civilian group. This means that the Association would control the flow of tuna in the Atlantic Ocean area.

In practice, the Association has been setting catch quotas for the Atlantic Ocean fleet and the Fishery Agency has been licensing fishing vessels to operate as "experimental" fishing vessels within the framework of the quotas set by the Association. The Fishery Agency has also been designating ports in the Atlantic Ocean, of which there are nine, where Japanese tuna long-liners could land their catches. However, in practice it took the Fishery Agency some time to issue permits for vessels to land their catches at certain ports so that at times fishing vessels were receiving the authority some time after they had landed their catches.

The Fishery Agency plans to draft a broad policy for the Atlantic Ocean tuna fishery and to leave the execution of the policies and the management of the fishery to the Association. (Nippon Suisan Shimbun, July 10, 1961.)

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FROZEN ALBACORE TUNA EXPORT MARKET CONDITIONS:

The prevailing high ex-vessel prices paid in June 1961 for albacore by canners in Japan are making it most difficult for frozen tuna exporters to compete for raw fish. The export price of frozen albacore was about US\$320 to \$330 a short ton in that month, but canners were reported to be offering as much as 130 yen a kilogram (\$327 a short ton) for raw albacore and frozen tuna exporters cannot compete at that price. As a result, consignments of frozen albacore for export purposes as of June only amounted to about 200 tons and it is unlikely that more than 400 tons of albacore taken by the Japanese fleet will be exported this year.

Exports of albacore caught by the Japanese shore-based fleet have been declining in the last two years. In 1959, those exports amounted to 800 tons; in 1960, about 600 tons. (Suisan Tsushin, June 30, 1961.)

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FISHERY LANDINGS DOWN AT YAIZU IN MAY 1961:

Landings of tuna and other fish at the important Japanese tuna port of Yaizu during May 1961 totaled 16,900 metric tons, 186 tons less than in the same month last year. Ex-vessel prices were higher than last year and the value of the landings was \$4,143,889, about \$391,000 above the value reported last year. The bulk of the landings was tuna.

Yaizu Fishery Landings, May 1961	
Species	Metric Tons
Tuna:	
Bluefin	272
Indian	492
Big-eyed	1,926
Albacore	3,512
Skipjack	4,647
Yellowfin	369
Swordfish, broadbill	58
Mackerel	3,484
Others	2,165
Total May 1961	16,925
Total May 1960	17,111
1/Indian Ocean bluefin tuna.	

Entering into the regular season for albacore and skipjack, landings increased somewhat in May but they were not enough to fill the demand of the canners.

Landings of all fish at Yaizu during January-May totaled 56,008 tons, valued at \$14,811,111 ex-vessel--3,383 tons less than last year in quantity but \$2,279,908 more in value. (Suisan Keizai Shimbun, June 22, 1961.)

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Japan (Contd.):

TUNA LANDINGS AT YAIZU IN JUNE 1961:

A survey made by the Yaizu Fisherman's Cooperative Association shows that in June 1961 a total of 16,709 metric tons of fish valued at 1,477,560,000 yen (US\$4.1 million) were landed at Yaizu, one of Japan's major tuna ports. This represents an increase of 3,690 metric tons and 258 million yen (\$717,000) over June 1960.

Skipjack tuna led in landings with 5,894 metric tons, an increase of about 2,600 tons over the same month last year. Albacore landings totaled 5,253 metric tons, or about 600 tons less than in June 1960. (Suisan Keizai Shimbun, July 6, 1961.)

Fishery Landings at Port of Yaizu				
Species and Period	Qty.	Value		Average Ex-Vessel Price
	Metric Tons	1,000 Yen	US\$ 1,000	US\$ Per Short Ton
June 1961:				
Skipjack tuna . . .	5,894	400,741	1,113	\$169
Albacore " . . .	5,253	657,899	1,827	\$315
Other tuna species	3,820	344,847	958	\$227
Pacific mackerel .	1,193	43,467	121	\$ 91
Others	549	30,606	85	-
Total	16,709	1,477,560	4,104	-
Cumulative Landings:				
Jan.-June 1961 . .	72,829	-	18,900	-
Jan.-June 1960 . .	72,521	-	15,900	-

SUMMER ALBACORE TUNA FISHERY TRENDS AS OF JUNE 1961:

Much was expected from this year's Japanese summer albacore tuna fishery because early in the season oceanic and fishing conditions were considered favorable. In the latter part of May 1961, however, when the catch picks up rapidly in the average year, landings failed to increase as expected. June landings were no more than 30 or 40 percent of landings in the same period last year.

Some 7,300 metric tons of summer albacore were landed at Yaizu and Shimizu (two most important Japanese tuna ports) by June 10, which was but 60 percent of last year's 12,000 tons by the same date. The ex-vessel price dropped below US\$276 a metric ton in mid-May, but it rose again and around June 10 reached \$322-\$329 for fish weighing about 28 pounds. Buyers of the fish were almost entirely cannery because the price was too high for the freezers.

Summer Albacore Tuna Landings at Yaizu and Shimizu, April-June 1960-61					
Year	April	1st Part of May	Middle Part of May	Latter Part of May	1st Part of June
			(Metric Tons)		
1961	820	1,045	1,745	1,625	2,100
1960	425	225	955	5,240	5,205

Because of the poor albacore fishing through the first part of June this year, half of the 200 hook-and-line vessels fishing albacore switched to skipjack fishing. For this reason, skipjack tuna landings are increasing more than last year and as of mid-June, 200-300 tons a day on the average were being landed at Yaizu and Shimizu. The ex-vessel price for skipjack was \$163-\$185 a metric ton. Although the cannery have begun to buy skipjack, buying was not in full swing as of June 20. (Suisan Tsushin, June 20, 1961.)

ALBACORE TUNA FISHING PICKS UP:

According to a news dispatch from Yaizu, albacore fishing has picked up considerably. The combined landings of albacore at Yaizu and Shimizu from June 11-22, 1961 were reported from 200 to 500 metric tons of fish per day.

A survey made by the Tokai University's fishery laboratory shows that a total of about 190 to 200 tuna vessels are concentrated in the area of good fishing, which lies between 145° and 150° E. longitude and between 31° and 34° N. latitude. This concentration of effort in one area is causing the laboratory some concern. The laboratory feels that the areas to the east of 150° should also be explored in case fishing should fall off in the area of heavy fishing. (Suisan Keizai Shimbun, June 23, 1961.)

ALBACORE AND SKIPJACK TUNA LANDINGS AND PRICES, JUNE 18-24:

During the week of June 18-24, 1961, a total of 1,946 metric tons of albacore and 1,201 tons of skipjack were landed at the principal Japanese tuna ports of Shimizu and Yaizu. Price for albacore ranged from a low of 110 yen a kilogram (US\$277 a short ton) at the beginning of the week to a high of 137 yen a kilogram (\$345 per short ton) on June 22 and 23. Skipjack for the fresh fish market sold for a high of 160 yen a kilogram (\$403 per short ton) on June 20; skipjack for canning purposes sold from a low of 54 yen a kilogram (\$136 per short ton) to a high of 64 yen a kilogram (\$161 per short ton), but for the most part sold around the 61 yen level (\$153 a short ton).

Albacore landings at Shimizu totaled 677 metric tons, and at Yaizu 1,269 metric tons. Of the skipjack landed during the week, 1,071

Japan (Contd.):

metric tons were landed at Yaizu, of which 816 tons were landed during the last three days of the week. (Suisan Tsushin, June 26, 1961.)

ALBACORE AND SKIPJACK TUNA LANDINGS AND PRICES, JUNE 25-JULY 1, 1961:

For the week of June 25 to July 1, 1961, approximately 1,700 metric tons of albacore and 2,200 tons of skipjack tuna were landed at the three Japanese ports of Shimizu, Yaizu, and Kesennuma. These data are not complete since landings at Yaizu on July 1 and landings at Kesennuma for June 28 to July 1 are not included.

Albacore landings at Shimizu totaled 703 tons, Yaizu 886 tons, and Kesennuma 94 tons. Skipjack landings at Shimizu totaled 249 tons, Yaizu 1,660 tons, and Kesennuma 280 tons.

Ex-vessel prices for albacore ranged from a low of 114 yen a kilogram (US\$288 a short ton) at Kesennuma on June 27 to a high of 135 yen per kilogram (\$340 a short ton) at Shimizu on June 30. For the most part, albacore sold in the range of 120 to 130 yen a kilogram (\$302 to \$327 per short ton).

Skipjack ex-vessel prices showed a wide fluctuation depending on whether they were sold for the fresh fish trade or for canning purposes. Those for canning generally sold between 55 yen to about 68 yen a kilogram (\$139 to \$171 a short ton). (Suisan Tsushin, July 3, 1961.)

ALBACORE AND SKIPJACK TUNA FISHING TRENDS, JULY 1961:

The albacore tuna schools early in July had moved farther offshore and the Japanese domestic tuna fleet was fishing for albacore approximately 900 to 1,000 miles east of the Japanese mainland. All small tuna vessels had switched to skipjack fishing. The larger tuna fishing vessels which were still fishing for albacore were reported to be averaging about 35-40 metric tons of albacore per trip. Those vessels were planning to make one final trip, which meant that albacore would be landed until the end of July.

For the first 15 days of July, the ex-vessel price of albacore held steady for the most part between 130 and 140 yen per kilogram (US\$327 to \$353 per short ton). These prices are somewhat higher than prices in late June when albacore sold for 120 to 130 yen per kilogram (\$302 to \$327 per short ton).

The ex-vessel price of skipjack crept up slightly towards the middle of July, with skipjack for canning purposes selling generally between 70 to 75 yen per kilogram (\$178 to \$189 per short ton). Towards the end of June, skipjack had sold between 55 to 68 yen per kilogram (\$139 to \$171 a short ton).

Landings of Tuna at Principal Japanese Ports

Port	Albacore	Skipjack	Yellowfin
(Metric Tons)			
July 2-8, 1961:			
Yaizu	358	1,382	-
Shimizu	135	185	-
Kesennuma ..	-	220	-
Total	493	1,787	-
July 9-15, 1961:			
Yaizu	380	976	157
Shimizu	264	125	15
Kesennuma ..	-	565	-
Total	644	1,666	172

A small quantity (172 metric tons) of yellowfin was landed towards the middle of July and ex-vessel prices ranged from 60 to 85 yen per kilogram (\$151 to \$214 per short ton). (Suisan Tsushin, July 10 & 17, 1961.)

BIG-EYED TUNA FISHING REPORTED GOOD:

Japanese fish sausage makers who earlier this year faced a shortage of tuna were reported to have an ample supply of fish on hand as of June 1961. This turn of events was attributed to the pickup in big-eyed tuna fishing in the area north of New Guinea and southwest of the Philippine Islands.

According to the captain of a Japanese vessel which landed 200 metric tons of big-eyed tuna at Yokohama in late June, all of which were sold to one firm for fish sausage, fishing was poor in the Indian Ocean and Australian waters and the Japanese tuna fleet was concentrated in the area between 125° W. and 135° W. longitude near the vicinity of 5° N. latitude. Catches consisted mainly of big-eyed tuna, and they were being utilized primarily for fish sausage.

Big-eyed tuna had sold ex-vessel for over 100 yen a kilogram (US\$251 a short ton) in November and December 1960, then dropped to about 90 yen a kilogram (US\$227 a short ton) in April and May of this year, and in June was selling for 80 to 70 yen a kilogram (US\$201 to \$176 a short ton). Some companies had anticipated a decline in landings and had stocked up large quantities of big-eyed tuna when it sold for 90 yen a kilogram (US\$227 a short ton), but were not able to dispose of the fish.

The decline in the big-eyed tuna price is attributed not only to the excellent catches, but to some extent also to the lack of cold-

Japan (Contd.):

storage space in Japan. Salmon and bottom-fish taken in the North Pacific Ocean and Ber-
ing Sea are now being landed in Japan proper
and they are putting a critical drain on avail-
able storage space. (Suisan Keizai Shimbun,
June 22, 1961.)

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NUMBER OF VESSELS FISHING TUNA
IN THE ATLANTIC OCEAN:

As of the end of May 1961, there were
about 60 Japanese tuna vessels operating in
the Atlantic. Reports indicate that catches
have begun to decrease rapidly and the catch
by some vessels has been reduced to less
than 8,270 pounds a day on the average. This
drop in catch is causing concern among those
engaged in fishing tuna in the Atlantic.

When tuna fishing began in the Atlantic in
1957 and 1958, some vessels caught 33,080
pounds a day on the average and the catch
rate was 14-15 fish per 100 hooks. The catch
rate has been reduced to some 6-8 fish per
100 hooks. Also, because of the drop in
catch, the number of operating vessels is de-
clining. Because of this it is believed that
this year's total catch in the Atlantic is like-
ly to be much lower than last year's catch.

Planned Number of Japanese Vessels in the Atlantic Tuna Fishery, April-September 1960-61						
Year	April	May	June	July	Aug.	Sept.
1961	64	60	(Number)	51	47	46
1960	54	55	55	56	57	60

While in 1960 the number of vessels fish-
ing tuna in the Atlantic gradually increased
from 54 in April to 60 in September, this
year the number is expected to decline from
64 in April to 46 in September.

It was also reported that two tuna vessels
of a large California cannery which this past
year have also been fishing tuna in the Atlan-
tic, have left for California because of de-
creasing catches. (The Suisan Tsushin, June
15 and 17, 1961.)

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POOR FISHING FORCES TUNA
LONG-LINERS TO MOVE
SOUTHWARD IN ATLANTIC OCEAN:

Poor fishing in the Atlantic Ocean during
June 1961 in the area between 10° N. and 10°

S. latitude off the West African coast, where
the Japanese tuna long-line vessels normally
operate, has compelled the Japanese tuna fleet
to search for new grounds. The Japanese tuna
fleet began to move southward in mid-June
and by late June were operating in the vicinity
of 10° S. latitude and 10° E. longitude, with
some vessels fishing around 20° S. latitude
towards the Brazilian side of the Atlantic
Ocean.

Until late June the Japanese tuna long-
liners were averaging from 2 to 3 metric tons
of tuna per day, but fishing was reported to
have picked up since the fleet moved south,
with one 400-ton vessel reporting catches of
6 to 7 tons per day. However, as of the end
of June 1961, Atlantic Japanese tuna catches
were down about 40 percent as compared to
the same period last year.

The price for Japanese yellowfin tuna ex-
ports to Italy has been raised from \$280 to
\$285 a metric ton. (Suisan Keizai Shimbun,
July 8 and 13, 1961.)

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TUNA MOTHERSHIP FIRMS PLAN TO
TRANSSHIP FROZEN TUNA
TO UNITED STATES:

A large Japanese fishing company, which
operates the tuna mothership Nojima Maru,
planned to transship 960 short tons of frozen
tuna from the mothership's catch to the United
States. This shipment was to be loaded at
Suva, Fiji Islands, in early September 1961
and delivered to San Francisco. The firm al-
so planned to have her carrier vessels make
three trips to Japan during the course of the
tuna mothership fishing season in the South
Pacific, and transport 960 tons of frozen tuna
on each trip. The company's parent company
was expected to handle all sales, both domes-
tic and foreign.

Another large fishing company, which op-
erates the tuna mothership No. 3 Tenyo Maru,
planned to transship to the United States via
Suva approximately 2,100 tons of frozen tuna
from that mothership's catch. The firm's
carrier vessels were scheduled to make a to-
tal of three trips to the United States, carry-
ing about 700 tons per trip. The trips were
scheduled for July 23, August 10, and Septem-
ber 1. In addition to these three transship-
ments, the same firm planned to ship to Ja-
pan about 4,000 tons of frozen fish in five
separate shipments of 800 tons each (would
include big-eyed tuna, large yellowfin

Japan (Contd.):

over 100 pounds dressed, and shark) for use in fish sausage.

Catches of Two Japanese Tuna Mothership Fleets in South Pacific

Species	"Nojima Maru" (as of June 16)	"No. 3 Tenyo Maru" (as of June 18)
	(Metric Tons)	(Metric Tons)
Yellowfin	685	1,147
Albacore	293	795
Spearfish	173	310
Others	181	272
Total	1,332	2,524

A third Japanese fishing company planned to dispatch a tuna mothership to the South Pacific sometime in August. The article does not identify the mothership but in the past the firm has utilized the Jinyo Maru (7,200 gross tons) as a tuna mothership and it was expected that this same vessel would be utilized for this purpose again. As of late June the Jinyo Maru was engaged in salmon fishing. The firm's tuna mothership quota for this year is 3,612 metric tons. (Suisan Tsushin, June 24; Suisan Keizai Shimbun, June 22, 1961.)

RESEARCH VESSEL EXPLORES NORTH AND CENTRAL PACIFIC OCEAN FOR TUNA:

The Japanese Fishery Agency's research vessel Shoyo Maru, 603 gross tons, was scheduled to depart Tokyo July 18 to conduct a two-month survey of tuna fishing grounds in the north and central Pacific Ocean. The vessel called at Honolulu on August 13 to bring Japanese fisheries scientists to the Tuna Conference scheduled for mid-August.

En route to Honolulu, the Shoyo Maru planned to explore the grounds roughly between 160° W. longitude and between 38° and 42° N. latitude and on its return to Japan to survey the distribution of young tuna in the area lying between 160° E. and 175° W. longitude along 20° N. latitude. (Japanese periodicals Suisan Keizai Shimbun, June 18; Shin Suisan Shimbun Sokuho, July 11, 1961.)

CATCHES OF TUNA MOTHERSHIPS IN SOUTH PACIFIC:

The Japanese tuna motherships No. 3 Tenyo Maru and Nojima Maru have caught a total of 4,725 metric tons of fish as of June 27, 1961.

Japanese Tuna Mothership Catches in South Pacific		
Species	"No. 3 Tenyo Maru"	"Nojima Maru"
	(Metric Tons)	(Metric Tons)
Tuna:		
Yellowfin . . .	1,286	897
Albacore . . .	958	465
Big-eyed . . .	-	128
Other species .	165	-
Spearfish . . .	349	223
Shark	119	75
Other species .	26	34
Total	2,903	1,822

No. 3 Tenyo Maru fleet (45 catcher vessels) was reported averaging 3 tons of fish per catcher vessel per day; Nojima Maru fleet was averaging about 2.8 tons of fish per catcher vessel per day. (Suisan Keizai Shimbun, June 29, 1961.)

The carrier vessel Tsukishima Maru, 1,170 gross tons, was expected to transship 960 tons of frozen tuna from the tuna mothership Nojima Maru. The Tsukishima Maru was scheduled to depart Suva, Fiji Islands, on August 23 and arrive in San Francisco around September 13. (Suisan Keizai Shimbun, June 30, 1961.)

FORECAST OF JAPANESE HALIBUT CATCH BY VESSELS OPERATING IN BERING SEA BOTTOMFISH FISHERY:

The Japanese halibut catch target in the Bering Sea for the 1961 season, published in Japanese periodicals in May and June, is a composite figure compiled from license applications submitted to the Japanese Fishery Agency by the operating companies. The Fishery Agency does not exercise quantity controls over the Halibut catch by mothership fleets in the North Pacific. The latest compilation gives the target for the halibut catch as 46,253 metric tons. This target is for true halibut only, according to a July 20 report from the United States Embassy in Tokyo.

Japanese halibut fishing is being conducted between 170 degrees E. longitude and 175 degrees W. longitude along the 200-300 meter (109-164 fathom) curve from Cape Olyutorski to 175 degrees W. longitude. The gear used is mainly long lines. Trawls are fished but not as successfully because of rough bottom. Operating units consist of 127 long-line vessels and 68 trawlers. Halibut range from 60 to 80 centimeters (23 to 31 inches) in length, or 13 to 21 pounds each.

No definite schedule is followed in landing the halibut catch in Japan. When mothership freezers are taxed to capacity during

Japan (Contd.):

operations, halibut with other species are delivered by carrier vessels to Japan. Halibut are generally dressed, sectioned into three pieces, and frozen.

There is no concrete information on the amount of halibut exports for 1961. The Japan Frozen Food Export Association informed the Embassy an export target has not been set up for halibut. The Fishery Agency advised that halibut exports for 1960 amounted to about 10 percent of the catch. Preliminary figures for 1960 show the halibut catch as 7,269 metric tons with 600 metric tons exported to the United States. In 1959 exports totaled 411 metric tons of which 408 tons went to the United States and 3 tons to Great Britain.

In 1960 only 4 mothership fleets operated in the area described above, but in 1961, 20 mothership fleets are fishing the same area for halibut and other species of fish. The total catch of halibut as of July 19 this season was 5,950 metric tons round weight. Wholesale halibut prices in Tokyo are: small 28 U. S. cents a kilo (12.7 cents a pound), medium 30 cents a kilo (13.6 cents a pound), large 32 cents a kilo (14.5 cents a pound). Demand is reported very active on the Japanese market. Halibut exports to the United States January-June 1961 amounted to 177 metric tons, with no exports to other countries.

Unofficial but informed sources regard the catch target for 1961 unrealistic and estimate that the halibut catch will be about 10,000 metric tons.

PLANS FOR EXPORT OF FROZEN HALIBUT TO UNITED STATES:

As a new undertaking in 1961, a large Japanese fishing company is reported to have decided to start exports of halibut to the United States beginning in July 1961, through a large Japanese trading company. Two export contracts with United States importers and one with a British firm have been concluded.

According to informed Japanese sources, the latest estimate for exports of frozen halibut to the United States is 2,000 short tons of dressed fish and steaks, of which

1,500 tons will be steaks. (Suisan Keizai Shimbun, June 17, 1961.)

BERING SEA BOTTOMFISH FISHERY CATCHES LOWER THAN EXPECTED:

Some of the Japanese firms which have fleets engaged in the Bering Sea bottomfish fishery are becoming concerned that operations may be in the red this year. Catches to mid-June 1961 were lower than expected and the drop in catches is attributed to the large concentration of fishing vessels in a relatively confined area. Of a total of 28 fleets, 20 fleets are concentrated in the area between Cape Navarin and Cape Olyutorski.



Fig. 1 - Japanese trawler attached to Japanese factoryship Shimyo Maru.

Prior to the beginning of the fishing season, an agreement had been drafted by the companies concerning the conduct of vessels planning to fish in the Olyutorski area but this agreement on operations is reported to be rather ineffectual. The fishing companies feel that the only way to correct the present situation and help increase production is to remove the restrictions on the fishing grounds and allow the vessels to fish elsewhere.

Specifically, the companies hope to have the ban removed prohibiting their mothership fleets from fishing in areas other than A, B, C, and D. They want their vessels to be allowed to operate in areas E and F, as well as in the waters to the west of 170° E. longitude and south of the Alaskan Peninsula.



Fig. 2 - Repairing nets aboard the Japanese refrigeration factoryship Shimyo Maru.

Japan (Contd.):

The Japanese Fishery Agency has expressed the view that requests to remove area restrictions will be denied. The waters to the west of 170° E. longitude in the Bering Sea are presently set aside for Japanese trawlers operating out of Hokkaido, and areas E and F are presently restricted to the fish meal motherships, oil-and-meal factoryships, and refrigeration factoryships which operated in those waters in previous years. These are the vessels: Renshin Maru (14,094 gross tons), Gyokuei Maru (10,357 gross tons), Chiyo Maru (7,194 gross tons), and Kinvo Maru (9,373 gross tons), which are classified as fish meal factoryships; Tenyo Maru (11,581 gross tons), which is classified as an oil-and-meal factoryship; and the Shinvo Maru (5,630 gross tons), which is listed as a refrigeration factoryship. The Fishery Agency believes that the companies already engaged in fishing in the above areas (areas E and F and the waters to the west of 170° E. longitude) would strongly oppose changes permitting other fleets to fish in waters which they had developed. As far as permitting fishing south of the Alaska Peninsula is concerned, the Fishery Agency definitely has no intention of opening up this area due to the likelihood of halibut being caught incidentally with other bottom fishes. (Suisan Keizai Shimbun, June 23 & 25, 1961.)

Note: Areas A, B, C, and D include the waters in the Bering Sea between 170° E. longitude and 170° W. longitude; area E includes the waters to the east of 170° W. longitude; and area F is the triangular area formed by a line extending from Cape Navarin to the Aleutian Islands along 180° longitude, east to Cape Sarichef, Unimak Island, and back to Cape Navarin.

FISH MEAL PRODUCTION BY BERING SEA FACTORYSHIPS AS OF JUNE 30:

Production of the Japanese fish meal factoryships operating in the Bristol Bay area as of June 30 totaled 26,156 metric tons of fish meal, 5,750 metric tons of fish solubles, and 1,224 metric tons of fish oil. Five factoryships belonging to three fishing companies are operating this season in the Bering Sea. (Suisan Tsushin, July 10, 1961.)

FACTORYSHIP FISH MEAL PRICES:

It appears likely that the fish meal produced by the Japanese fish meal factoryships operating in the Bering Sea will be sold between 54,000 to 54,500 yen per metric ton (US\$136.00-137.89 a short ton) during the first sale of this product. Producers hope to get about 55,000 yen per metric ton (\$138.80 a short ton); whereas, the national federation representing users hopes to pay about 53,000 yen a metric ton (\$133.36 a short ton).

Fish meal users also hope to have the price of fish meal fixed according to protein content. At the present time, the standard for protein content is 65 percent but the protein content of imports fluctuate between 60 to 65 percent. The protein content of fish meal produced by the Japanese fish meal factoryships range from 67 to 70 percent and it will be to the benefit of companies oper-

ating these factoryships to have a system where prices are fixed according to protein content adopted, although this proposal originated from users. (Japanese fishery periodicals Shin Suisan Shimbun Sokuho, July 6; Nippon Suisan Shimbun, July 7, 1961.)

CANNED JACK MACKEREL EXPORTS:

The Japanese Canned Jack Mackerel Exporters Association reports that consignments to the Association for the period April to June 1961 totaled 294,653 cases. Of that amount, 221,557 cases were contracted for, leaving a balance of slightly over 70,000 cases on hand.



Miyako in Iwate Prefecture is considered Japan's leading mackerel port. Just before the opening of the mackerel season (some time in September), boats assemble at Miyako flying colorful pennants and at 6 a.m. on the opening day sail for the fishing areas.

The market for Japanese canned jack mackerel is limited to the countries in Southeast Asia. Shipments of this product in April-June were mainly to Singapore and Malaya, totaling 101,427 cases, or nearly half of the total sales for the April-June period. Sales to West Africa were next highest, totaling 46,890 cases, or approximately 20 percent of the total sales. Sales to Borneo, Hong Kong, and Indonesia ranged from 3,000 to 4,000 cases. (Suisan Keizai Shimbun, June 21, 1961.)

CANNED SARDINE PACK AND SALES:

The Japanese canned sardine pack April 1 to June 30, 1961, totaled 159,334 cases. During that same period, 188,600 cases were sold for export, of which 95,000 cases went to the Philippines, 27,600 cases to Belgium, 22,840 cases to West Africa, 13,350 cases to Indonesia, and lesser amounts to countries

Japan (Contd.):

in Southeast Asia. Stocks on hand early in July totaled 5,600 cases.

The boycott of South African sardines carried out by some West African and Southeast Asian nations is reported to be having a beneficial effect on Japanese sales of sardines. (Suisan Keizai Shimbun, July 11, 1961.)

NATURAL PACK SARDINES TO BE CANNED:

Japan stopped producing natural-pack sardines for export purposes a few years ago since she was not able to compete with the pack produced by South Africa. Instead, Japan concentrated on packing sardines in tomato sauce. However, a shortage of tomato sauce exists in Japan at the present time, particularly in Choshi, Chiba Prefecture, and Japan has decided to go ahead and produce a limited amount of natural-pack sardines this year.

The Export Canned Sardine Fisheries Association held a meeting with the sardine joint sales company on June 27, 1961, and unofficially established the following prices for No. 4 (16-oz. can) canned sardines (natural) and a temporary pack target of 50,000 cases: wholesale price 2,050 yen (US\$5.69) per case; canner's price 1,960 yen (US\$5.44) per case.

Early in July sardines sold ex-vessel for 70 to 80 yen per kan (\$47-\$54 a short ton) at Choshi, where fishing is excellent. Sardine fishing is very poor elsewhere in Japan and some packers in other regions are buying sardines from Choshi at a cost of 130 to 140 yen per kan (\$87-\$94 per short ton). As of July 3, Choshi packers had not yet begun to produce natural-pack sardines which sell at a lower price than sardines packed in tomato sauce. At the ex-vessel price of \$47 to \$54 a short ton, Choshi packers are reported to be making a profit of around 500 yen (\$1.40) per case on canned sardines in tomato sauce. (Suisan Tsushin, June 28 & July 4, 1961.)

EXPORT PLANS FOR CANNED PINK SALMON IN 1961:

Japan plans to export 300,000 cases (No. 2 or 7 $\frac{3}{4}$ -ounce cans) of canned pink salmon at a price of US\$11.80 per case f.o.b. Japan.

The 300,000 cases are expected to be sold to England and Australia. This amount is in addition to the 100,000 cases bought earlier this year by six United States firms. (Suisan Tsushin, July 1 & 4, 1961.)

EASTERN HOKKAIDO LAND-BASED SALMON FISHERY:

The Japanese Fishery Agency began to issue fishing licenses on June 21, 1961, to the Hokkaido-based salmon gill-net fishing vessels planning to fish in the Northwest Pacific Fisheries Convention waters to the north of 45° N. latitude. Fishing was permitted in this restricted area beginning July 5 and ending August 10. Only gill-net vessels were permitted to fish in that area and they were required to pick up their permits by July 5.



Retrieving gill net and removing salmon from net aboard a Japanese gill-netter in the North Pacific.

A total of 415 gill-net vessels were allowed to fish in the restricted waters--277 were vessels ranging in size from 30 gross tons to a maximum of 75 tons (licensed by

Japan (Contd.):

the Minister of Agriculture and Forestry), and the remaining 138 vessels ranged in size from 5 tons to 30 tons (licensed by the Governor of Hokkaido). The Fishery Agency fixed the individual quota of the 415 vessels according to vessel size. Total catch quota for the restricted area (north of 45° N. latitude and south of 48° N. latitude) is 11,400 metric tons of salmon. (Nippon Suisan Shimbun, June 23, 1961.)

NORTH PACIFIC SALMON MOTHERSHIP OPERATIONS AS OF JUNE 20:

The 12 Japanese salmon mothership fleets in the North Pacific, which commenced fishing on May 28, 1961, caught a total of about 26,000 metric tons of salmon as of June 18. Every fleet is said to have attained about half of its target. Catch of red salmon is said to be excellent, making up about 70 percent of the total catch.

Unlike last year, no fishing violations were reported. This is attributed to (1) the heavy fines that would be imposed on violators and (2) the threat of revoking the salmon fishing license of violators first in the event that developments make it necessary to reduce the size of the salmon fleet in the future. The lack of violations is attributed to some extent to the good catches of red salmon and the prospects of operating at a profit this year. Should fishing continue at the present level, some motherships were expected to terminate fishing around the middle of July, and others around July 20.

A later report stated that the 12 salmon fleets have taken a total of 26,402 metric tons of salmon as of June 20 and the fleets had begun to move westward. Some fleets had already met two-thirds of their quota and those vessels should have been able to catch their full quota well before the close of the fishing season on August 10, even if fishing slowed down. (Suisan Tsushin, June 22; Suisan Keizai Shimbun, June 27, 1961.)

BRISTOL BAY KING CRAB FISHERY:

The Japanese king crab factoryship Tokei Maru operating in the Bristol Bay area had produced approximately 64,000 cases of canned king crab meat as of June 18, 1961. If



Tokei Maru, Japanese crab factoryship.

crab fishing continued good, the Tokei Maru was expected to reach her target of 80,000 cases in early July. (Suisan Keizai Shimbun, June 21, 1961.)

BRISTOL BAY CRAB-FACTORYSHIP ATTAINS PACK GOAL:

The Tokei Maru (5,385 tons) crab-fishing fleet jointly operated in Bristol Bay by three Japanese companies reported early in July 1961 that it had attained its pack goal of 80,000 cases (48 ½-lb. cans) of canned crab meat. The fleet this year left the fishing grounds for Hakodate, Hokkaido, a few days earlier than last year. (Japanese newspaper, July 8, 1961.)

Editor's Note: Early this year the Shinyo Maru factoryship fleet was also reported fishing crabs in Bristol Bay but no pack target was announced for it.

MOTHERSHIP FLEETS OPERATING IN NORTH PACIFIC, 1961:

Data on the projected catch of salmon, bottomfish, crabs, and whales by the Japanese mothership fleets operating in the North Pacific in 1961 have been obtained from the Japanese Fishery Agency and segments of the fishing industry. These data confirm and summarize information obtained piece-meal from various Japanese periodicals.

Japan (Contd.):

Salmon Fishery: A total of 12 mothership fleets with 410 catcher boats are operating in the North Pacific salmon fishery. All of the fleets left May 21, 1961. The production quota for the mothership fleets is 53,600 metric tons. The mothership fleets were allotted 82 percent of the Japanese quota of 65,000 metric tons set under the terms of an agreement reached at the 1961 Japanese-Soviet fishery negotiations. The remainder of the quota of 11,400 tons was assigned to the land-based fishery. In addition, a permissible catch of 70,000 tons outside the regulated waters of the Soviet-Japanese Convention area or south of 48° N. latitude has been set.

Bottomfish Fishery: A total of 28 motherships with 362 catcher boats are engaged in the North Pacific bottomfish fishery. Most of the fleets left port in April, but a few left in May. One fleet is expected to return on July 22, 3 on September 30, and the balance late in October. The estimated production of the fleets is 61,984 metric tons of fish meal, 145,729 tons of frozen fish, 2,512 tons of salted fish, and 56,400 cases of shrimp (48 $\frac{1}{2}$ -lb. cans).

Crab Fishery: A total of 6 mothership fleets with 79 catcher boats are fishing for crabs in the North Pacific. Two of the fleets left port on April 5, and 4 on April 24, 1961. Four of the six fleets have an estimated production target of 65,000 cases (48 $\frac{1}{2}$ -lb cans) each, one fleet 80,000 cases, and for the sixth fleet no production target has been set.



A good haul of king crabs aboard a Japanese crab factoryship in the North Pacific.

Whaling: Two mothership fleets with 15 catcher boats are hunting and processing whales in the North Pacific. Both left port in May. One fleet has a quota of 1,800 sperm

whales, and the second has a quota of 800 blue-whale units. (United States Embassy, Tokyo, June 8, 1961.)

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LARGE FIRM'S PLANS FOR FROZEN AND CANNED OYSTER EXPORTS IN 1961:

A large Japanese oyster producer-processor firm plans to export to the United States 300 short tons of frozen oysters and 40,000 cases of canned oysters between August and November 1961.

In 1960, this firm exported to the United States 32 tons of frozen oysters at 50-55 cents a pound f.o.b. Japan and 60,000 cases of canned smoked oysters. The glass-packed oysters sold for \$4.10 and the canned oysters sold for \$3.80 per case f.o.b. Japan.

The pack of canned oysters in Japan in 1961 is estimated at 210,000 cases, or about 50 percent of a normal year's production of 400,000 cases. As a result, prices are expected to go up in late fall. (*Suisan Keizai Shimbun*, June 30, 1961.)

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FROZEN SWORDFISH EXPORTS TO THE UNITED STATES:

The estimated quota for Japanese swordfish production for 1961 is about 5,500 metric tons. The bulk of this quota will be filled during periods of good fishing, usually between June and September and between December and February of each year. In 1960, Japan's exports of frozen swordfish to the United States consisted of 5,003 metric tons of swordfish fillets, 188 tons of



A swordfish being hauled aboard a Japanese catcher boat.

Japan (Contd.):

Table 1 - Japanese Frozen Swordfish Exports to United States

Month	Fillet 1/		Chunk 2/		Steaks 3/	
	Qty.	Value	Qty.	Value	Qty.	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
1960:						
January . . .	492	282	12	7	83	58
February . . .	715	352	16	11	140	98
March . . .	417	269	29	12	122	86
April . . .	467	243	33	26	129	89
May . . .	226	125	13	9	95	66
June . . .	219	117	5	5	89	64
July . . .	232	176	11	5	82	60
August . . .	465	274	14	11	87	63
September . . .	418	324	9	7	75	56
October . . .	320	221	19	15	90	68
November . . .	528	359	15	11	99	78
December . . .	484	424	12	12	176	146
Total 1960 . . .	5,003	3,166	188	131	1,267	932
1961:						
January . . .	597	473	18	15	185	159
February . . .	469	355	25	21	277	221
March . . .	377	246	24	18	257	195
April . . .	329	204	21	16	n.a.	n.a.

1/Under 30 to 70 pounds per piece.

2/80-100 pounds and over per chunk.

3/Less than 2 pounds per piece.

n.a. - Not available.

Table 2 - Japanese Average F.O.B. Prices for Frozen Swordfish Exports to U. S.

Month	Pounds				
	Over 100	80-100	50-70	30-40	Under 30
(U. S. Cents a Pound),				
1960:					
January . . .	28.0	28.7	26.3	25.8	24.3
February . . .	28.5	29.1	26.6	25.6	23.9
March . . .	29.3	29.0	26.1	25.1	21.4
April . . .	29.2	30.1	27.3	24.6	23.0
May . . .	34.5	31.6	29.5	27.1	23.6
June . . .	35.6	32.8	30.0	21.0	25.6
July . . .	35.5	34.2	31.7	27.8	26.3
August . . .	36.6	35.5	34.4	30.0	27.5
September . . .	37.6	37.0	36.0	30.2	29.5
October . . .	38.7	38.0	36.1	34.2	31.3
November . . .	42.0	41.1	38.6	36.9	33.6
December . . .	42.6	41.9	40.6	40.1	36.5
1961:					
January . . .	42.7	42.5	38.8	36.5	34.8
February . . .	36.8	49.8	35.8	33.5	29.9
March . . .	34.0	36.0	32.5	32.1	29.5
April . . .	35.1	33.0	33.2	24.2	26.2

chunks, and 1,267 tons of steaks. (United States Embassy, Tokyo, June 12, 1961.)

RESEARCH ASSOCIATION TO STUDY REVISION OF INTERNATIONAL NORTH PACIFIC FISHERIES CONVENTION:

The Northern-Seas Fisheries Resources Research Council, which is a unit of the Japan Fisheries Association, has set up a Japan-United States Canada Fishery Agreement Research Association within the Japan-United States-Canada Fishery Subcommittee.

The purpose of this new Association is to study and make recommendations for revision of the International Convention for the High-Seas Fisheries of the North Pacific Ocean, which has been in force since June 1953.

The Research Association held its first plenary session on June 17, 1961. It was reported in the Japanese language press that the Treaty is an unequal one which forces Japan to abstain from fishing for salmon and salmon-trout east of the provisional territory line located at 175° W. longitude and that the Research Association is expected to study this and other problem areas with a view to the possible revision of the Convention. (United States Embassy, Tokyo, June 30, 1961.)

TRANSHIPMENTS OF ATLANTIC TRAWL FISHERY CATCHES OFF WEST AFRICA:

Catches of the Japanese trawl fleet operating in West African Atlantic waters are primarily being transshipped to Japan via commercial vessels. The first transshipment of 400 tons of trawl fish was made in September 1960. Since then, transshipments via foreign commercial vessels have been increasing. To cite recent shipments: June 4, 1961, the vessel *Ispaniola* unloaded 2,300 tons of fish at Shimizu; July 6, the vessel *Golden Ocean* was scheduled to have unloaded 1,200 tons of fish at Shimonoseki in southern Japan. As of June 26, approximately 6,000 tons of trawl fish have been transshipped to Japan on commercial vessels; whereas, only 1,800 tons have been brought back to Japan by fishing vessels.

The cost of transporting frozen fish from West Africa to Japan is reported to be cheaper than the cost of hauling frozen fish from Japan to the United States.

One of the large Japanese fishing companies operating in the West African trawl fishery expects catches to increase, and plans on placing the freezer vessel No. 37 *Banshu Maru*, 3,700 gross tons, on the Atlantic run when that vessel is not engaged in hauling fish from the North Pacific Ocean and Bering Sea. The same fishing company is also constructing a freezer vessel of about the same size as No. 37 *Banshu Maru*, which it plans to put on the Atlantic run.

Two other Japanese fishing companies are engaged in the Atlantic trawl fishery off West Africa. These two companies are also plan-

Japan (Contd.):

ning to tranship the catches of their trawl fleets. (*Nippon Suisan Shimbun*, June 26, 1961.)

Editor's Note: The first company mentioned uses the port of Las Palmas, Canary Islands, as a base of operations for its Atlantic trawl fleet and is presently constructing a 3,000-ton cold-storage plant at that port.

TARIFF NEGOTIATIONS WITH EEC NATIONS INCLUDED FISHERY PRODUCTS:

The Japanese Government announced on July 4, 1961, the results of the GATT (General Agreement on Tariffs and Trade) negotiations with the European Economic Community (EEC) nations. Nine items were removed from the tariff schedule and 23 appended items negotiated. Four of the 23 items are marine products, which Japan exports to Italy and West Germany:

Product	Common Market Rate	Range of Existing Rates in EEC Bloc
	... (Percent Ad Valorem) ...	
Tuna (fresh & frozen)	25	0-20
Whale oil	0	0-5
Fish nets	19	18
Pearl products	0	10

Marine products for which tariff rates were agreed upon earlier:

Product	Common Market Rate	Range of Existing Rates in EEC Bloc
	... (Percent Ad Valorem) ...	
Canned tuna	25	20-25
Canned salmon	18	14-30
King crab meat	20	30
Agar-agar	4	15
Pearl	0	0

Although the Common Market tariff rate on frozen tuna of 25 percent represents an increase of 5 percent from the existing rate in the Common Market nations, which ranges from 0 to 20 percent, the Italian Government, through its Embassy in Tokyo, announced in mid-May that Italy will not tax imports of frozen tuna until 1971. This means that the Common Market rate for frozen tuna will go into effect in 1969 in all Common Market nations (West Germany, France, Netherlands, Belgium, and Luxembourg) except Italy.

According to earlier reports, these nations were reported to be considering a common tariff rate of 7.5 percent for 1962, which would then be raised to 15 percent and

then to 25 percent in 1969. (Japanese periodicals *Suisan Tsushin*, March 30; *Shin Suisan Shimbun*, July 10, 1961.)

TUNA VESSELS APPROVED FOR CONSTRUCTION, FISCAL YEARS 1958-60:

A total of 407 tuna fishing vessels were approved for construction for fiscal year 1960 (April 1, 1960 to March 31, 1961), according to the Japanese Fishery Agency. This is the largest number of tuna vessels ever licensed for construction in any one year since the end of World War II, and represents an increase of 85 vessels over fiscal year 1959 and 255 over fiscal year 1958. The increase in 1960, which is due largely to the relaxation of regulations on enlarging tuna fishing vessels, is mainly in tuna vessels under 40 tons, for which licenses are not required, and in steel vessels over 200 tons. On the other hand, applications for permits to construct medium-class tuna vessels (40 tons to 100 tons) showed a decline.

Table 1 - Tuna Vessels Approved for Construction, Fiscal Years, 1958-60

Size and Type	FY 1960		FY 1959		FY 1958	
	No. Vessels	Gross Tons	No. Vessels	Gross Tons	No. Vessels	Gross Tons
Steel Vessels:						
Under 100 tons	30					
100 to 200 tons	6					
Over 200 tons	96					
Total	132	39,578	93	28,936	38	10,617
Wooden Vessels:						
39-ton vessels	250					
40 to 100 tons	25					
Total	275	11,509	229	10,854	114	6,996
Grand Total	407	51,087	322	39,790	152	17,613

As for vessels actually launched in any one year, fiscal year 1960 also leads in this category. For 1960, a total of 112 steel vessels and 214 wooden vessels were completed.

Table 2 - Tuna Vessels Completed in Fiscal Year 1960

Steel Vessels:	
Less than 100 tons	33
Between 100 to 200 tons	3
Over 200 tons	76
Total	112
Wooden Vessels:	
39 gross tons	194
40 to 100 tons	17
(not indicated)	3
Total	214

Construction of medium-class tuna vessels is at a low level and this development will likely affect the tuna mothership fishery. Tuna motherships presently cannot utilize vessels over 200 tons as catcher vessels and they already are having difficulty chartering vessels under 200 tons.

One development of the present vessel construction trend has been the boom in the market of license rights. It is reported that tuna fishing license rights are now selling for about 300,000 yen (US\$830) a ton. (*Suisan Keizai Shimbu*, May 17, 1961.)



Mauritania

GOVERNMENT ENCOURAGES INVESTMENT IN FISHING INDUSTRY:

The Livestock, Maritime Fisheries, and Animal Industries Service of the Republic of Mauritania has issued a brief publication entitled *Note sur les Possibilites de Peche sur la Cote Mauritanienne* ("Note on the Fishing Possibilities off the Coast of Mauritania"). It attempts to show very briefly what the potentials are for the development of the industry.

According to this publication, between 20,000 and 35,000 metric tons of "courbine," *Sciaena aquila* (probably croaker-like species), *Diagramma mediterraneum* (probably species of snapper), mullet, and small sharks are caught by Canary Islanders within Mauritania's coastal waters. The catch, which is seasonal, supplies three small industrial fish-drying and salting plants in Port-Etienne, which in turn annually export approximately 3,000 tons to central African markets. In addition, two spiny lobster (*langouste*) canneries are established in Port-Etienne.

A large number of foreign trawlers operate outside the territorial waters of Mauritania. At one count, there were 80 Spanish, 39 Portuguese, 10 Greek, and 6 Italian vessels fishing for a wide variety of fish. Also, 660 tons of live spiny lobsters and 670 tons of frozen spiny lobster tails were exported and an unregistered amount were caught within the territorial waters of Mauritania.

The publication concludes with an outline of investment costs and equipment available for prospective industry. Offered are lots for construction, and approximate costs for electricity, fresh water, ice, labor and petroleum products are quoted, as are customs dues and taxes.

Although the Mauritanian fishing industry is relatively undeveloped, and recently received a major set-back when a newly-acquired large freezing and canning vessel was completely destroyed by fire, the Government continues to press for added investment in this field. Of particular promise is the spiny lobster industry which is already exploited by the French. (United States Embassy in Dakar, June 30, 1961.)



Malaya

JAPANESE NEGOTIATE FOR ANOTHER TUNA FISHING BASE:

The Japanese Tokushima (Prefecture) Tuna Fishing Cooperative Association plans on sending two of its members to Kuala Lumpur, Federation of Malaya, to investigate the possibility of establishing a joint fishing base at Kuala Lumpur and to negotiate with Malayan officials on this matter. The Association hopes to construct a cold-storage plant and a cannery, and base a fleet of 100-ton tuna fishing vessels at Kuala Lumpur.

Japanese already operate one joint fishing company in Penang located to the north of Kuala Lumpur. This firm, which began operations in February 1960, has a cannery capable of processing tuna. The entire production (canned tuna in soybean oil) of this firm is presently being exported to Europe. In May 1961, the firm was reported to be having difficulty in contracting Japanese tuna fishing vessels to fish for the company. Subsequently, this firm had to shut down for a while due to lack of fish but was expected to resume normal operations. Two tuna fishing vessels, No. 10 Kompira Maru, 149 gross tons, and No. 5 Myojin Maru, 96 gross tons, from Miyagi Prefecture, have agreed to fish for the company. These two vessels were expected to depart Japan for Penang in late July. As of June 1961, only one vessel, No. 2 Fuku Maru, was fishing for the firm. This vessel is operating in the Indian Ocean. (Japanese fishery periodicals *Nippon Suisan Shimbun*, July 5; *Suisan Tsushin*, July 11, 1961; and miscellaneous sources.)



Mexico

WEST COAST SHRIMP FISHERY TRENDS, SECOND QUARTER 1961:

Shrimp landings at Mexico's west coast ports of Guaymas and Mazatlan during the second quarter of 1961 were heavier than normal, the shrimp sizes were smaller, and brown shrimp predominated. This resulted in lower prices. As of May 30, 1961, nearly 14,800 metric tons (8,315 tons at Mazatlan and 6,479 tons at Guaymas) had been landed at the two major shrimp ports on the Gulf of California, about 90 percent of the catch from the Gulf and the remainder from estuaries and rivers. Shrimp landings for the 1960/1961 season, which began in the fall of 1960 and

Mexico (Contd.):

ended on July 15, were higher than the previous season, but prices were low--ex-vessel prices for the season through June of this year averaged 56 to 57 U.S. cents a pound as compared to an average of 70 cents a pound for the 1959/1960 season. Few vessels were active in the second quarter of 1961. At least one Mazatlan owner planned to send some of his vessels to the Baja California coast on July 15 when the closed season went into effect on the Gulf of California.

The "closed season" for the shallow estuaries which went into effect on April 15 will continue until October 1. Total landings in those areas rarely exceed 1,000 tons and this ban primarily affects cooperatives and small independent fishermen.

As of July 1, 1961, no information was available on landings by the Topolobampo, Sinaloa, and Puerto Penasco, Sonora, fleets but they account for only a small portion of the total landings on Mexico's west coast.

The project for the exploitation of species of edible fish other than shrimp had not worked well as of early July this year, with heavy losses reported in the Topolobampo area where this type of fishing is concentrated.

New benefits for the shrimp industry were announced in late May 1961, among them a 5-million peso (US\$400,000) credit for the construction of 14 new shrimp vessels for the Guaymas fleet. This will increase the number of vessels at Guaymas to 200. Most of the present vessels are over 12 years old.

During the recent campaign tour of the Governor-elect of Sonora, cooperative fishermen in Guaymas requested improved services, a delineation of the fishing boundaries between Sonora and Sinaloa, and the construction of a cooperative freezing plant. (United States Consulate, Nogales, dispatch dated July 6, 1961.)



Netherlands

FOREIGN TRADE, PRODUCTION,
AND SUPPLY OF FISH AND
MARINE-ANIMAL OILS, 1960:

Imports: In 1960, the Netherlands imported a total of 74,369 metric tons of crude fish

and marine-animal oils, valued at US\$13 million. Of the total quantity, 27.2 percent was received directly from whaling factoryships, 19.0 percent from the United States, and 14.3 percent from the Soviet Union.

Table 1 - Netherlands Imports of Fish and Marine-Animal Oils, 1960

Table 1 - Netherlands Imports of Fish and Marine-Animal Oils, 1960			
Product & Origin	Quantity	Value	
		Metric Tons	Guilder 1,000 US\$ 1,000
Fish & Marine-Animal Oils, Crude:			
United States	14, 147	8, 452	2, 241
Belgium-Luxembourg	409	230	61
United Kingdom	610	475	126
West Germany	2, 388	1, 327	352
Iceland	5, 034	2, 735	725
Norway	1, 766	1, 325	351
Sweden	32	16	4
Denmark	1, 390	700	186
Portugal	851	537	142
U. S. S. R.	10, 611	8, 018	2, 127
Morocco	224	84	22
Angola	36	13	3
South West-Africa	1, 923	1, 201	318
Union of South Africa	2, 352	1, 623	430
Canada	618	493	131
Peru	1, 820	1, 013	269
Chile	248	203	54
Argentina	124	69	18
Japan	5, 446	4, 199	1, 113
Australia	3, 411	2, 724	722
New Zealand	668	525	139
Landings from whaling factoryships	20, 261	13, 202	3, 502
Total	74, 369	49, 164	13, 037
Fish & Marine-Animal Oils, Refined:			
United Kingdom	78	68	18
West Germany	110	87	23
Norway	342	406	108
Peru	1, 688	875	232
Japan	51	556	147
Other	18	17	5
Total	2, 287	2, 009	533
Spermaceti:			
Belgium-Luxembourg	1/	1	1/
United Kingdom	2	5	1
Other	2	3	1
Total	4	8	2

1/Less than 1 metric ton or US\$1,000.

Notes. Values converted at rate of 3.771 guilders equals US\$1.

1/Less than 1 metric ton or US\$1,000.

Note: Values converted at rate of 3,771 guilders equals US\$1.

In the same year, the Netherlands also imported 2,287 tons of refined fish and marine-animal oils valued at US\$533,000. The bulk of these imports came from Peru. In addition, 4 tons of spermaceti were imported valued at US\$2,000 (table 1).

Exports: In 1960, the Netherlands exported a total of 6,720 tons of crude fish and marine-animal oils valued at US\$1.2 million--West Germany was the principal customer followed by France. In addition, the Netherlands exported 197 tons of fish or refined marine-animal oils valued at US\$70,000 and 1 ton of spermaceti (table 2).

Production: The Netherlands production of whale and fish oils from domestic and imported materials amounted to 16,000 tons in

Netherlands (Contd.):

Table 2 - Netherlands Exports of Fish and Marine-Animal Oils, 1960

Table 2 - Netherlands Exports of Fish and Marine-Animal Oils, 1960			
Product & Destination	Quantity	Value	
	Metric Tons	Guilders 1,000	US\$ 1,000
Fish & Marine-Animal Oils, Crude:			
United States	226	181	48
Belgium-Luxembourg	352	202	54
France	2,010	1,607	426
West Germany	3,696	2,107	558
Denmark	98	73	19
Spain	50	40	11
Italy	174	129	34
Egypt	75	63	17
Other	39	23	6
Total	6,720	4,425	1,173
Fish & Marine-Animal Oils, Refined:			
Belgium-Luxembourg	68	71	19
France	15	14	4
Norway	11	70	19
Italy	47	47	12
Canary Islands	30	27	7
Australia	10	15	4
Other	16	20	5
Total	197	264	70
Spermaceti:			
Belgium-Luxembourg	1/	1	1/
Other	1	1	1/
Total	1	2	-
1/Less than 1 metric ton a US\$1,000.			

1/ Less than 1 metric ton a US\$1,000.

1960. Domestic production alone in 1960 amounted to 15,535 tons (11,982 tons of whale oil and 3,553 tons of fish oils) as compared to 24,111 tons (18,894 tons of whale oil, 5,216 tons of fish oils, and 1 ton of sperm oil) in 1959.

Supply and Distribution: In 1960, total distribution of edible whale and fish oils in the Netherlands amounted to 97,607 tons.

Table 3 - Netherlands Edible Whale and Fish Oil Supply and Distribution, 1960

Item	Quantity Metric Tons
Supply:	
Opening Stocks	21,051
Imports	76,656
Production	15,535
Total Supply	113,242
Disposition:	
Exports	6,918
Domestic Utilization:	
As food-hardened refined oil	56,578
Other uses	2,949
Ext. exports in mixed products	20,000
Waste, loss in refining & stock calculation error	11,162
Total Distribution	97,607
Closing stocks	15,635

The available supply totaled 113,242 tons (table 3). (U. S. Foreign Agricultural Service Report, The Hague, May 16, 1961.)

Note: See *Commercial Fisheries Review*, Jan. 1960 p. 81, Aug. 1960 p. 63.

FISH MEAL PRICES AND PRODUCTION:

In the early part of 1960, consumer prices (free on farm) of fish or whale meal in the Netherlands dropped sharply from US\$124 a short ton in January 1960 to a low of \$88 a ton in July of that year. Thereafter, the price recovered and remained generally steady until March 1961, when a minor decline set in and continued into April 1961 when the price was \$98 a ton (see table).

Monthly Price of Fish Meal^{1/}, January 1960-April 1961, in the Netherlands

Month	Value	
	Guilders Per 100 Kg.	US\$ Per Short Ton
1960:		
January	51.20	124
February	46.00	110
March	44.30	106
April	43.90	106
May	43.60	104
June	40.80	98
July	36.50	88
August	37.60	90
September	42.00	102
October	41.20	100
November	41.70	100
December	42.00	102
1961:		
January	42.30	102
February	42.40	102
March	41.90	100
April	40.90	98

1/ Protein content 61.4 percent.

Note: (1) Values converted at rate of 3.771 guilders equal US\$1.

(2) Consumer prices free on farm.

Fish and whale meal production dropped drastically from 15,685 metric tons in 1959 to 7,694 tons in 1960. (U. S. Foreign Agricultural Service Report, The Hague, May 16, 1961.)

WHALE OIL PRICES AND UTILIZATION:

The c.i.f. Rotterdam price of whale oil only declined a fraction of a U. S. cent per pound in the first 9 months of 1960. In November 1960, the price recovered and remained at the higher level until March 1961, when it declined by 0.5 cents. The price again declined slightly in April 1961, reaching 8.9 cents per pound, the lowest price since January 1960 (see table).

The amount of refined hardened whale oil used in producing margarine and food fats for domestic consumption increased slightly from 56,378 metric tons in 1959 to 56,578 tons in 1960. Of the 1960 total, 50,684 tons were used in the manufacture of margarine and 5,894 tons in food fats. In 1959, a total

Netherlands (Contd.):

Monthly Prices of Whale Oil in the Netherlands, January 1960-April 1961		
Month	Value	
	Guilders Per 100 Kg.	US Cents Per Pound
1960:		
January	80.00	9.6
February	79.00	9.5
March	77.60	9.3
April	78.25	9.4
May	77.65	9.3
June	77.15	9.3
July	-	-
August	76.50	9.2
September	74.70	9.0
October	74.50	9.0
November	77.80	9.4
December	79.70	9.6
1961:		
January	80.25	9.7
February	79.75	9.6
March	75.25	9.1
April	73.85	8.9

Note: (1) Values converted at rate of 3.771 guilders equal US\$1.
(2) Offering c.i.f. Rotterdam prices as reported about the 15th of each month.

of 50,961 tons was used in margarine and 5,417 tons in food fats. (U.S. Foreign Agricultural Service Report, The Hague, May 16, 1961.)



Norway

COD FISHERY TRENDS,
JANUARY-JUNE 17, 1961:

The 1961 season's total landings of mature and young cod in Norway January 1-June 17, 1961, amounted to 129,808 metric tons, compared with 111,059 tons for the same period last year. Of this year's landings, 76,261 tons were sold for drying, 25,402 tons for salting, and 28,145 tons for sale fresh or frozen (includes 18,241 tons used for filleting). This season's fishery

also yielded 56,319 hectoliters (5,238 metric tons) of cod-liver oil and a substantial quantity of cod roe. (Fiskets Gang, June 22, 1961.)

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FOREIGN TRADE AND
PRODUCTION OF MARINE OILS:

Foreign Trade: Norway's total imports of marine oils increased slightly, from 56,506 metric tons valued at US\$10.9 million in 1959 to 60,183 tons valued at US\$11.2 million in 1960. Imports of crude whale oil and industrial fish-liver oil fell sharply in 1960, while imports of "other marine oils" showed the greatest gain (table 1). The bulk of the marine oil imports consisted mainly of raw material for the hardening industry.

Because of Norway's drastic drop in herring catches, imports of raw herring oil from Iceland (the most important source) were more than three times as high in 1960 than during the previous year, while imports of marine oil from West Germany (the second largest exporter to Norway) declined slightly. United States shipments to Norway also declined in 1960 as did shipments from the United Kingdom.

Norway's 1959-60 imports of high potency (vitamin A) fish-liver oil came mostly from the Union of South Africa; imports of industrial and mixed fish-liver oils came mostly from Iceland; and imports of residual fish-liver oil mainly from Sweden.

Norway in 1960 also received 12,264 tons of "other marine oils" valued \$2.6 million. Of the total, 5,412 tons came from West Germany, 4,744 tons from the United States, 1,009 tons from Iceland, and the balance from Denmark, Peru, Chile, and other countries.

Table 1 - Norway's Imports of Marine Oils, 1959-1960

Commodity	1960			1959		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		1,000 Kr.	US\$ 1,000		1,000 Kr.	US\$ 1,000
Whale oil, crude	366	346	48	5,432	8,579	1,202
Sperm & bottlenose oil, crude	672	908	127	50	59	8
Herring oil, crude	41,265	47,579	6,664	39,478	49,752	6,968
High potency (vitamin A) marine-animal oils	1,408	8,125	1,138	961	6,425	900
Cod-liver oil	29	44	6	521	785	110
Veterinary fish-liver oil	87	111	16	1/	1	2/
Industrial fish-liver oil	2,910	3,352	469	7,125	9,698	1,357
Residual fish-liver oil	1,182	606	85	2,199	1,139	160
Other marine oils	12,264	18,565	2,600	740	1,910	268
Total	60,183	79,636	11,153	56,506	78,348	10,973

1/Less than 500 kilograms.
2/Less than US\$1,000.

Norway (Contd.):

Table 2 - Norway's Marine Oil Imports by Origin, 1959-1960

Commodity and Country of Origin	1960			1959		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Whale oil, crude, total	366	346	48	5,432	8,579	1,202
Sperm & bottlenose oil, total	672	908	127	50	59	8
Herring oil, crude:						
United States (probably menhaden oil),	3,109	3,368	472	12,110	15,394	2,156
Finland	339	398	56	-	-	-
Iceland	21,960	26,223	3,673	1,275	1,615	226
Sweden	1,619	1,402	196	1,861	2,087	292
Portugal	198	193	27	371	354	50
United Kingdom	463	540	76	2,113	2,500	350
West Germany	8,778	9,884	1,384	15,064	19,639	2,751
Chile	450	475	67	-	-	-
Peru	1,183	1,374	192	495	494	69
Others	3,166	3,722	521	6,189	7,669	1,074
Total	41,265	47,579	6,664	39,478	49,752	6,968
High potency (vitamin A) fish-liver oil:						
Union of South Africa	814	2,036	285	792	1,977	277
Japan	444	2,482	348	107	2,436	341
Others	150	3,607	505	62	2,012	282
Total	1,408	8,125	1,138	961	6,425	900
Industrial and mixed fish-liver oils, pale:						
Iceland	2,647	3,071	430	4,992	6,950	973
Others	109	161	23	427	432	61
Total	2,756	3,232	453	5,419	7,382	1,034
Residual fish-liver oils:						
Denmark	116	51	7	179	99	14
Sweden	944	469	66	1,446	736	103
Others	122	86	12	574	304	43
Total	1,182	606	85	2,199	1,139	160
Other marine oils:						
United States	4,744	9,872	1,384	-	-	-
Denmark	558	573	80	26	26	4
Iceland	1,009	1,249	175	-	-	-
West Germany	5,412	6,157	862	200	1,106	155
Peru	222	258	36	505	481	67
Chile	260	289	40	-	-	-
Others	59	167	23	9	297	42
Total	12,264	18,565	2,600	740	1,910	268

Most of the oil from the United States was menhaden oil, and it is believed that some of the oil from West Germany is also re-exports of United States menhaden oil. Since in 1959 only 1,910 tons of "other marine oils" were imported, it is quite evident that the sharp increase in 1960 imports was due to Norway's herring fishery failure (table 2).

Total Norwegian exports of marine oils and marine oil products decreased from 195,200 tons valued at US\$42.9 million in 1959 to 149,473 tons valued at US\$33.4 million in 1960. The heavy decrease in crude whale oil exports were mainly responsible for this decline. Exports of crude seal oil and edible refined marine oils were the only products whose exports increased in 1960 (table 3).

Table 3 - Norway's Exports of Marine Oils and Products, 1959-1960

Commodity	1960			1959		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Whale oil, crude ^{1/}	65,551	93,485	13,093	92,719	131,421	18,408
Sperm & bottlenose oil	8,683	11,901	1,667	13,408	14,890	2,085
Herring oil, crude	200	199	28	625	666	93
Seal oil, crude	3,860	5,255	736	3,248	4,434	621
Fish-liver oils	15,564	29,201	4,090	18,444	33,503	4,692
Refined marine oils, edible	1,442	2,559	358	1,026	1,868	262
Refined marine oils, other	2,358	3,733	523	3,259	3,621	507
Marine animal oils, polymerized, oxidized, etc., edible	77	135	19	678	1,223	171
Hardened fats from marine-animal oils, edible	37,478	69,173	9,688	44,651	85,111	11,920
Hardened fats from marine-animal oils, for technical use	4,336	6,869	962	8,329	14,137	1,980
Fatty acids from marine oils, fatty alcohol	8,000	14,416	2,019	8,056	14,239	1,994
Other products	1,924	1,252	175	777	1,531	214
Total	149,473	238,178	33,358	195,220	306,644	42,947

^{1/}Including sales made directly from the Antarctic.

Norway (Contd.):

Table 4 - Norway's Exports of Marine Oils by Destination, 1959-1960

Commodity and Destination	1960			1959		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Whale oil, crude, total ^{1/}	65,551	93,485	13,093	92,719	131,421	18,406
Sperm & bottlenose oil, crude, total ^{1/}	8,683	11,901	1,667	13,408	14,890	2,085
Seal oil, crude:						
France	121	184	26	196	304	43
West Germany	3,637	4,923	689	3,016	4,069	570
Others	102	148	21	36	61	8
Total	3,860	5,255	736	3,248	4,434	621
Medicinal cod-liver oil:						
United States	533	1,177	165	729	1,552	216
Finland	110	347	49	115	354	50
Netherlands	295	591	83	301	593	83
Czechoslovakia	525	1,089	153	571	1,193	167
Turkey	177	533	75	440	1,061	149
West Germany	185	413	58	155	357	50
Brazil	169	342	48	167	335	47
Others	1,737	3,645	509	1,691	3,581	502
Total	3,731	8,137	1,140	4,169	9,026	1,264
Veterinary cod-liver oil:						
Denmark	1,371	2,301	322	1,353	2,244	314
Finland	110	347	49	151	306	43
Sweden	1,414	2,180	305	1,449	2,226	313
Italy	404	603	84	545	825	116
Netherlands	94	168	24	147	244	34
United Kingdom	2	3	2/	101	159	22
Switzerland	388	563	79	477	715	100
Austria	128	206	29	144	229	32
Brazil	2	3	2/	106	164	23
Hong Kong	259	412	58	138	237	33
Singapore	338	555	78	74	133	19
Mexico	203	366	51	157	288	40
Others	489	682	96	661	1,138	159
Total	5,202	8,389	1,175	5,503	8,908	1,248
Other fish-liver oil (except residual & brown):						
Sweden	103	306	43	133	387	54
France	139	290	41	137	382	54
Italy	520	634	89	490	720	101
Netherlands	291	1,129	158	226	1,016	142
Poland	1,256	1,527	213	503	708	99
United Kingdom	100	1,404	197	72	1,296	182
Czechoslovakia	1,066	1,737	243	1,947	2,921	409
West Germany	976	1,444	202	2,158	2,920	409
Mexico	182	276	39	260	372	52
Brazil	331	459	64	465	697	98
Others	1,667	3,469	486	2,381	4,150	581
Total	6,631	12,675	1,775	8,772	15,569	2,181
Residual fish-liver oils, total ^{1/}	952	694	97	704	594	83
Edible marine fats & oils, total ^{1/}	37,478	69,173	9,688	44,651	85,111	11,920
Other marine fats & oils, total ^{1/}	4,336	6,869	962	8,329	14,137	1,980

^{1/}Distribution by countries not available.^{2/}Less than \$1,000.

In 1959 and 1960, most crude seal oil exports went to West Germany; the United States was the largest buyer of medicinal cod with 729 tons valued at US\$216,000 in 1959 and 533 tons valued at US\$165,000 in 1960; Denmark and Sweden were the leading purchasers of veterinary cod-liver oil, with Czechoslovakia and West Germany buying most of the "other fish-liver oil" (excepting residual and brown)--table 4.

Table 5 - Distribution of Norwegian-Produced Antarctic Whale Oil, 1959-1960

	1960	1959
	... (Long tons) ...	
Norway	39,533	33,123
West Germany	10,465	30,111
United Kingdom	24,869	31,064
Sweden	-	5,018
Denmark	2,997	7,021
France	-	10,937
Netherlands	19,929	6,104
Belgium-Luxemburg	5,167	-
Total	102,960	123,378

Norway (Contd.):

Table 6 - Distribution of Norwegian-Produced Sperm Oil, 1959-1960

	1960	1959
	... (Long Tons) ...	
United States	1,482	3,701
Norway	4,920	6,959
France	-	504
Netherlands	2,014	2,683
United Kingdom	1,885	-
West Germany	500	1,000
Total	10,801	14,847

Production: Norway's total marine oil production has generally declined over the past few years, mostly due to the depletion of the winter herring off the coast of Norway. Although the 1960 production of herring oil was 8,000 tons more than in 1959, the Antarctic whale-oil production was so much smaller that the year-end result was only 188,894 tons of marine oils as compared to 205,720 tons in 1959 (table 7). Because of

Norway's 1961 winter herring season ended with a surprisingly small catch. Only 7,068 tons of winter herring were used for fish meal and oil, a fraction of the 130,200 tons used in 1959 and the 213,900 tons used in 1960. Therefore, the amount of herring oil produced in 1961 from Norway's winter herring fishery was negligible. In April 1961 there was some interest among Norwegian fishermen to fish for herring off Iceland.

Norway's production of Antarctic whale oil amounted to 100,280 metric tons for the 1959/60 season. There was a steady decrease in production since the 1956/57 season. Antarctic sperm oil production amounted to 10,777 tons in 1959/60, continuing a downward trend which started in 1958/59.

Norwegian whale oil production from Husvik Harbor, South Georgia Island, declined from 10,523 tons in 1955/56 to 4,199 tons in 1958/59.

Table 7 - Norway's Production of Marine Oils, 1957-1961

Commodity	1961 ³	1960 ²	1959	1958	1957
	(Metric Tons)				
Cold cleared cod-liver oil	15,000	15,000	15,900	11,900	10,300
Other fish-liver oils	1,400	1,400	1,400	4,600	3,700
Herring oil	25,000	50,000	42,000 ¹	34,000	67,424
Total fish oils	41,400	66,400	59,300 ¹	50,500	81,424
Seal oil	5,000	5,000	4,500	5,500	4,700
Sperm oil:					
Antarctic	10,500 ⁴	10,984	15,097	20,751	16,874
Norwegian shore stations	500	698	216	672	227
Total sperm oil	11,000	11,682	15,313	21,423	17,101
Whale oil:					
Antarctic	100,000	105,043	125,480	123,946	153,167
Norwegian shore stations	800	769	1,127	612	769
Total whale oil	100,800 ⁵	105,812	126,607	124,558	153,936
Total Marine Oils	158,200	188,894	205,720	201,981	257,161

1/ Revised.

2/ Preliminary.

3/ Estimate.

4/ Already sold.

5/ 90,000 tons sold by April 1961.

the scarcity of winter herring, the herring off Iceland and the small and fat herring off Norway were fished more extensively. It is anticipated that the decline in marine-oil production will continue into 1961. Total marine-oil production is expected to amount to 158,200 metric tons in 1961, some 100,000 tons less than in 1957.

Total fish-oil production is expected to decrease to 41,400 tons in 1961 due to the anticipated decline in herring oil production. Seal oil and sperm oil production should remain fairly constant in 1961, while total whale oil production will be down some 5,000 tons.

This production leveled off in 1959/60. Sperm oil production from that area increased in 1958/59, but fell off sharply in 1959/60.

Production of whale oil from the shore stations in Norway tended to level off during 1956-1958, nearly doubled in 1959, but declined again in 1960. On the other hand, sperm oil production from the shore stations reached a peak in 1958 and 1960 (table 8).

Norway's production of whale oil and sperm oil was sold, as issued, through the whaling companies' common marketing pool.

Norway (Contd.)

Table 8 - Norway's Whale Oil and Sperm Oil Production, 1955/56-1959/60 Seasons

	Whale Oil	Sperm Oil	Total Oil
 (Metric Tons)		
Pelagic Production, Antarctic:			
1959/60 ¹	100,280	10,777	111,057
1958/59	120,721	14,310	135,030
1957/58	123,976	20,756	144,732
1956/57	145,181	16,642	161,822
1955/56	111,405	22,271	133,676
Husvik Harbor, South Georgia:			
1959/60 ¹	4,294	159	4,453
1958/59	4,199	720	4,920
1957/58 ²	-	-	-
1956/57	8,024	236	8,259
1955/56	10,523	303	10,826
Shore Stations in Norway:			
1960 ¹	766	695	1,461
1959	1,122	215	1,337
1958	609	669	1,278
1957	766	226	993
1956	649	496	1,145
1955	1,043	310	1,353

¹/Preliminary figures.²The Norwegian shore station at Husvik Harbor was not in operation.

Note: Data converted from 1959/60-1959/60 season; one equals 5,205.23 barrels.

The Norwegian whaling companies reported that as of April 1961 they had sold 90,000 long tons of whale oil at £73 10s. (US\$205.80) a long ton. Of the amount sold, 30,000 tons went to Norwegian buyers and 60,000 tons to a large British firm. Of the sperm oil production, 10,500 long tons also had been sold.

The average price for Norwegian whale oil for the 1959/60 Antarctic season was £72 13s. 2d. (US\$203.44) a long ton as compared with £73 2s. 4d. (\$204.72), £72 2d. (\$201.62), and £85 16s. 5d. (\$240.30) a long ton for the three previous seasons. The total value of the 1959/60 whale oil production was 149 million kroner (\$20.9 million) as compared with 180 million kroner (\$25.2 million) for the previous season.

The average price of Norwegian sperm oil for the 1959/60 production season was £66 4s. 11d. (\$185.48) as compared with £50 1s. 3d. (\$140.17) a long ton for the previous season's production.

Marine oils are the primary source of raw material for Norway's production of margarine and edible fats. The use of marine oils increased in 1959 due to low prices, despite

Table 9 - Norwegian Production of Margarine and Edible Fats and Amount of Marine Oils Utilized, 1958-1960

	1960	1959	1958
	... (Metric Tons)		
Production:			
Margarine	92,184	92,460	93,415
Cooking fats	3,128	2,902	3,079
Emulsified fats	1,686	1,598	1,578
Total	96,998	96,960	98,072
Marine oils used	57,170	57,091	52,681

a smaller production of margarine and fats that year. Use of marine oils leveled off at 57,170 tons in 1960 (table 9). (U. S. Foreign Service Dispatch, Copenhagen, April 7, 1961.)

Note: Values in Norwegian kroner converted at 7.14 kroner equals US\$1, and values in English £1 equals US\$2.80.

* * * * *

MARINE-OIL OUTPUT
CONTINUES DOWNWARD:

Norwegian production of marine oils continued to trend downward in 1960, and a further decline is forecast for 1961.

There is some controversy as to whether the traditional sources of supply--the winter herring areas off the coast of Norway and the Antarctic whaling grounds--have been excessively used or whether the small catches are due to temporary natural causes. In recent years, the output of herring oil from the winter catch has declined sharply--the 1961 catch was the smallest since the near-failure of 1934. However, other grounds, such as the summer herring areas off the coast of Iceland and to a lesser extent Norway, are being expanded rapidly. The summer herring catch provided most of the fish oil produced in 1960.

Large stocks of marine oils will partially offset the lower outturn expected in 1961. Nev-

Norway's Supply and Distribution of Marine Oils, Annual 1955-60 and Forecast 1961

Item	Forecast 1961	1960 ¹	1959	1958	1957	1956	1955
 (1,000 Short Tons)						
Supply:							
Stocks, January 1	75.6	42.5	49.5	79.5	75.4	56.7	54.3
Production	192.0	208.1	226.8	222.6	283.5	306.7	269.5
Imports	-	66.4	62.3	17.3	22.6	21.1	50.1
Total supply	-	317.1	338.6	319.4	381.5	384.5	373.9
Distribution:							
Exports	-	164.8	215.2	212.2	236.1	223.1	227.5
Domestic consumption	-	76.8	80.8	57.7	65.9	86.0	89.7
Stocks, December 31	-	75.5	42.6	49.5	79.5	75.4	56.7
Total distribution	-	317.1	338.6	319.4	381.5	384.5	373.9
¹ /Preliminary.							

Norway (Contd.):

ertheless, imports of fish oils will probably increase sharply to fulfill Norway's trade commitments with the U. S. S. R. and other European countries. The major portion of marine-oil imports in 1960 was crude herring oil from Iceland and West Germany. Imports from the United States declined sharply, but they may increase in 1961.

The margarine industry uses most of the marine oils consumed in Norway. In 1960, over 70 percent of the total fats and oils used in the production of margarine was of marine origin.

About 27,240 short tons, or over one-half of Norway's exports of hardened marine oils,

was shipped to the U. S. S. R. in 1960. The traditional buyers of Norway's antarctic whale oil are the United Kingdom, the Netherlands, and West Germany. (Foreign Crops and Markets, July 3, 1961, U. S. Department of Agriculture.)
Note: See Commercial Fisheries Review, December 1960 p. 85.



Peru

FISH MEAL PRICES AND SALES,
APRIL 16-May 15, 1961:

The following fish meal prices and sales in the European market and United States markets were included in the May 15, 1961, issue of the Boletín Informativo, published by the Consorcio Pesquero del Peru S. A.

Table 1 - Peruvian Fish Meal Prices, April 16-May 15, 1961

Table 1 - Peruvian Fish Meal Prices, April 16-15, 1961						
Period and Destination	Unit	Price Range in US\$				
		Opening	Highest	Lowest	Closing	
<u>Flat Market Prices 1/:</u>						
<u>United States East Coast Shipments:</u>						
May 1-15	short ton c&f.	111.13	111.13	111.13	111.13	
" " "	" " f.o.b. 2/	90.72	90.72	90.72	90.72	
April 16-30	" " c&f.	N	N	N	N	
<u>Japanese Shipments 3/:</u>						
May 1-15	short ton c&f.	121.56	121.56	121.56	121.56	
April 16-30	" " c&f.	N	N	N	N	
<u>European Shipments:</u>						
May 1-15	short ton c&f.	109.77	113.40	109.77	113.40	
" " "	" " f.o.b. 2/	90.72	94.35	90.72	94.35	
April 16-30	" " c&f.	96.16	111.13	96.16	109.77	
" " "	" " f.o.b. 2/	77.11	92.08	77.11	90.72	
<u>Protein Market Prices 4/:</u>						
<u>United States Shipments:</u>						
May 1-15	protein unit c& f.	1.796	1.796	1.796	1.796	
" " "	short ton c& f.	116.74	116.74	116.74	116.74	
" " "	short ton f.o.b. 2/	90.43	90.43	90.43	90.43	
April 16-30 (same as for May 1-15)					
<u>European Shipments:</u>						
May 1-15	protein unit c& f.	N	N	N	N	
April 16-30	" " c&f.	N	N	N	N	
"N" - No sales.						
1/"Flat" market is for sales made with a guaranteed minimum of protein (usually 65 percent). Any excess of protein is to the buyer's advantage. The most important flat markets for Peruvian fish meal are the east coast of the United States and West Germany.						
2/The <u>Boletín Informativo</u> showed prices in metric tons c& f. F.o.b. prices were calculated by subtracting US\$19.05 a short ton (equal to \$21.00 a metric ton) for cost of freight to Europe, \$26.31 a short ton (equal to \$29.00 a metric ton) for freight to the United States west coast, and \$20.41 a short ton (equal to \$22.50 a metric ton) for freight to U. S. Gulf of Mexico ports. Prices per unit converted to prices per short ton on basis of 65 percent protein meal.						
3/Freight rates to Japan not available.						
4/"Protein" market is based on the price per unit of protein and buyers must pay for any excess protein found by laboratory analysis of shipments on arrival. The most important market on this basis is the west coast of the United States.						

Peru (Contd.):

Table 2 - Peruvian Fish Meal Sales ^{1/}, Feb. 14-May 15, 1961

	May 2-15	Feb. 14-Mar. 15	Total
	(Metric Tons).....		
Flat Market Sales:			
To U. S.	3,000	700	3,700
" Europe.....	3,350	20,687	24,037
" Japan.....	100	N	100
Protein Market Sales:			
To U. S.	900	8,600	9,500
" Europe.....	N	5,200	5,200
Total	7,350	35,187	45,537
^{1/} Exclusive of future contracts made prior to February 15, 1961.			
"N" - No sales.			

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FISH MEAL PRICES AND SALES,
MAY 1-JUNE 15, 1961:

The following fish meal prices and sales in the European market and United States markets were included in the June 15, 1961, issue of the Boletín Informativo, published by the Consorcio Pesquero del Peru S. A. (Consortium).

From May 16 to June 15, 1961, the Consortium received 194 firm offers for fish meal of which 125 for 69,387 metric tons were approved as follows: June 12, 637 tons; July 15, 050 tons; August 16, 350 tons; September 16, 400 tons; October 7, 350 tons; November 1, 000 tons; and December 600 tons. Included in the total sales are 800 tons of steam-dried fish meal and 1,000 tons of bonito fish meal sold to the European "flat"

Table 1 - Peruvian Fish Meal Prices, May 1-June 15, 1961

Table 1 - Peruvian Fish Meal Prices, May 1-June 15, 1961					
Period and Destination	Unit	Price Range in US\$			
		Opening	Highest	Lowest	Closing
<u>Flat Market Prices ^{1/}:</u>					
<u>United States East Coast Shipments:</u>					
May 16-June 15	short ton c.&f.	N	N	N	N
May 1-15	" " c.&f.	111.13	111.13	111.13	111.13
" " " "	" " f.o.b. ^{2/}	90.72	90.72	90.72	90.72
<u>European Shipments:</u>					
May 16-June 15	short ton c.&f.	113.40	121.56	109.77	116.12
" " " "	" " f.o.b. ^{2/}	94.35	102.51	3/90.72	97.07
May 1-15	" " c.&f.	109.77	113.40	109.77	113.40
" " " "	" " f.o.b. ^{2/}	90.72	94.35	90.72	94.35
<u>Protein Market Prices ^{4/}:</u>					
<u>United States Shipments:</u>					
May 16-June 15	protein unit c& f.	1.796	1.842	1.796	1.842
" " " "	short ton c& f.	116.74	119.73	116.74	119.73
" " " "	short ton f.o.b. ^{2/}	90.43	93.42	90.43	93.42
May 1-15	protein unit c&f.	1.796	1.796	1.796	1.796
" " " "	short ton c&f.	116.74	116.74	116.74	116.74
" " " "	" " f.o.b. ^{2/}	90.43	90.43	90.43	90.43
<u>European Shipments:</u>					
May 16-June 15	protein unit c&f.	1.669	1.751	1.669	1.751
" " " "	short ton c&f.	108.40	113.82	108.40	113.82
" " " "	" " f.o.b. ^{2/}	89.44	94.77	89.44	94.77
May 1-15	protein unit c&f.	N	N	N	N
"N" - No sales.					
^{1/} "Flat" market is for sales made with a guaranteed minimum of protein (usually 65 percent). Any excess of protein is to the buyer's advantage. The most important flat markets for Peruvian fish meal are the east coast of the United States and West Germany.					
^{2/} The <u>Boletín Informativo</u> showed prices in metric tons c&f. F.o.b. prices were calculated by subtracting US\$19.05 a short ton (equal to \$21.00 a metric ton) for cost of freight to Europe, \$26.31 a short ton (equal to \$29.00 a metric ton) for freight to the United States west coast, and \$20.41 a short ton (equal to \$22.50 a metric ton) for freight to U. S. Gulf of Mexico ports. Prices per unit converted to prices per short ton on basis of 65 percent protein meal.					
^{3/} Revised from \$92.72.					
^{4/} "Protein" market is based on the price per unit of protein and buyers must pay for any excess protein found by laboratory analysis of shipments on arrival. The most important market on this basis is the west coast of the United States.					

Peru (Contd.):

market. During the May 16- June 15, 1961, period, 5,100 tons were sold to Japan at \$104.00 a metric ton f. a. s. or about \$94.35 a short ton. The average f. o. b. price for all shipments of fish meal made between March and May this year was \$76.49 a metric ton (US\$69.39 a short ton).



Singapore

FISHING INDUSTRY, 1960:

Landings of fish and shellfish in 1960 in Singapore amounted to 9,100 metric tons (includes landings by all principal types of fishing gear), according to estimates provided by the Singapore Director of Primary Industry. Consumption of fishery products in 1960 amounted to about 37,300 tons. In 1959, landings of fish and shellfish were estimated at 11,300 tons and consumption of fishery products at 38,900 tons.

The licensed fishing fleet in 1960 consisted of 1,774 non-powered vessels, 603 vessels powered with outboard motors, and 164 vessels powered with inboard motors. Comparable figures for 1959 were: 1,904 non-powered vessels, 639 vessels with outboard motors, and 154 vessels with inboard motors. (United States Consulate in Singapore, June 9, 1961.)



South Pacific Islands Territories

TRAINING CENTER STUDIES FISHERY IMPROVEMENT FOR MELANESIANS:

A 10-week training center to instruct Melanesian fishermen in the operation of improved fishing gear and mechanized fishing craft was held beginning August 23, 1961, in Tulagi, British Solomon Islands Protectorate. It was sponsored jointly by the Food and Agriculture Organization (FAO) and the South Pacific Commission (SPC). The South Pacific Commission, representing the governments of Australia, France, the Netherlands, New Zealand, the United Kingdom, and the United States, administers the South Sea Islands Territories.

"Fishing is an important activity for subsistence in an island economy," said the

chief of FAO's fishing gear section. "The soil is limited on coral atolls and with increasing island populations, the Melanesians have to turn even more to the sea for food.

"The inshore reefs and lagoons are generally overfished. The island fisherman lacks the proper equipment and the training for fishing in deep water, where mechanized boats are needed."

The training center was conducted on a practical level and included a maximum of training at sea under commercial fishing conditions. It was for island fishermen from the Melanesian archipelago.

The training center in Tulagi was the second such center held this year by FAO's fishing gear section. The other center was held in Viet Nam.



South-West Africa

CANNED FISH INDUSTRY

OPTIMISTIC ABOUT 1961 SALES:

South-West African fish canners are optimistic about this year's sales prospects and are hoping to do better even than in 1960, a record year. In early June this year, 4,000 tons of canned fish left Walvis Bay for the Philippines which the chairman of one of the fishery firms calls "unquestionably the largest market available under present conditions to South-West Africa." (United States Embassy in Pretoria, June 29, 1961.)

PILCHARD FISHING SEASON STARTS:

As of April 1961, the Union of South Africa Cape west coast factories and vessels were reporting their best pelagic shoal fishing season. At the same time, the factories and vessels of South-West Africa's Walvis Bay in March 1961 started after the 375,000 short tons of pilchards and maasbanker which they will be allowed to catch during 1961. But the Walvis Bay 1961 season did not get off to the spectacular start of January fishing off the Cape coast. Due to unusual weather and hydrographic conditions, large mature pilchards were scarce and many very young fish were taken. However, fishing improved considerably in April although the oil yield of 16 to 17 gallons from a ton of raw fish was far below the 25 gallons and more obtained

South-West Africa (Contd.):

from Cape pilchards. With Walvis Bay factories geared to repeat and perhaps improve on their remarkable canning performance of 1960, the appearance of firm, mature fish will be eagerly awaited by the fishing fleets.

The Union of South Africa Cape oil yield coupled with extremely high catches has boosted the early season exports of fish body oil. In March the first bulk shipment, 4,800 tons, was sent to Europe. This was followed by another shipment of 4,000 tons. A third shipment of 5,400 tons from Cape Town and 730 tons from Walvis Bay was also on its way to Europe. (*The South African Shipping News and Fishing Industry Review*, May 1961.)

**Tanganyika****FISHERY PRODUCTION INCREASING:**

The Government of Tanganyika has made progress in augmenting its fish production, and plans to conduct a survey this year to determine the potential for enlarging its national fishing industry. The survey will be supervised by an FAO fish marketing specialist.

Tanganyika has a possibility of becoming one of Africa's largest fish producers if it employs all of its resources. Tanganyika either contains or borders on Lake Tanganyika, Nyasa, Rulwa, and Victoria--all large bodies of water with a commercial fishing potential.

**Union of South Africa****PILCHARD-MAASBANKER FISHERY LANDINGS, JANUARY-MARCH 1961:**

The Union of South Africa Cape west coast pilchard-maasbanker fishery (with about 150 vessels fishing) during the first three months of the 1961 season landed 228,628 short tons pilchards, 11,880 tons maasbanker (jack mackerel), and 12,419 tons mackerel. The total catch was 252,927 tons.

According to figures released by the Division of Fisheries, the March catch was 64,698 tons pilchards, 4,145 tons maasbanker, and 3,663 tons mackerel--a total catch of 72,506 tons. In March 1960 the catch was 66,286 tons pilchards, 12,285 tons maasbanker, and 5,756 tons mackerel; and 34,146 tons pilchards, 5,999 tons maasbanker, and 7,116 tons mackerel in March 1959.

The March catch this year yielded 15,884 short tons fish meal, 1,261,776 imperial gallons fish body oil, 5,846,708 pounds canned pilchards, 1,261,776 pounds canned maasbanker, and 1,515,296 pounds canned mackerel.

Union of South Africa--Products Produced from Pilchard-Maasbanker Fishery Landings, January-March 1961				
Fish Meal	Fish Oil	Pilchards	Canned Maasbanker	Mackerel
Short Tons	1,000 Imp. Gals		(1,000 Lbs.)	
52,204	4,488	13,669	3,215	7,663

In April, early reports indicated that good catches continued and it was expected that the first four months this year would show landings of well over 300,000 tons of pilchards, maasbanker, and mackerel. More than ever, this year pilchards are accounting for the bulk of the catch. The good condition of the fish and the appearance of schools close to the Cape west coast plants have resulted in increased output of canned fish. (*The South African Shipping News and Fishing Industry Review*, May 1961.)

WAREHOUSING AND SHIPPING OF FISH MEAL IN PAPER BAGS:

The principal advantage claimed for paper bags, as opposed to burlap bags, as a package for fish meal is that it substantially eliminates the spontaneous heating hazard according to Memorandum No. 99 of the South Africa Fishing Industry Research Institute.

A well-constructed and properly closed paper bag with an effective bitumen or tar liner acts as a sealed container.

Causes of spontaneous heating depend on the free access of air containing oxygen and moisture. The elimination of air results in stoppage of all spontaneous heating.

The efficacy of bitumen-lined paper bags in reducing spontaneous heating has been demonstrated repeatedly. In all cases it was found that the temperature of meal produced from herring, California sardines, and South African pilchards, when packed in bitumen-lined paper bags, rose only a few degrees above the initial packing temperature before commencing to cool. The rate of cooling is dictated by the size of the bag. It appears that the initial temperature rise is due to the consumption of the oxygen present between the particles of meal in the bag.

Fish meal in bitumen-lined paper bags may be stacked immediately only if the meal is cool, as prolonged exposure to high tempera-

Union of South Africa (Contd.):

ture (e.g., 140° F. or higher) is known to have an adverse effect on the nutritional quality of the meal. It is chiefly for this reason that it has been advocated that fish meal in paper bags should be stacked as cool as possible. Taking local climatic and other conditions into account, the temperature should not exceed 100° F. Furthermore, high temperatures may dry out and embrittle the paper; may soften the glue or the bitumen which might then creep under pressure, etc. The temperature limit of 100° F. must therefore be strictly adhered to at the time of stacking and storage.

The following conditions pertaining to the bags themselves are required to ensure the safe shipping of fish meal in paper bags, i.e.: (1) The paper bags must be impermeable to oxygen, must have an adequate bitumen lining, and must be of adequate strength. (2) All torn or broken bags must be replaced or filled into "overslip" bags. If an occasional broken bag happens to be overlooked, this will not necessarily endanger the cargo but an accumulation (say ten or more) of broken bags in the center of a stack must be avoided; it is felt that with normal supervision no broken bags need go undetected. Fish meal in suitable bitumen-lined paper bags is a safer and more hygienic cargo than when packed in burlap bags.

Paper bags are known to have certain disadvantages, e.g., liability to breakage and the possibility of staining with very oily fish meal; they are furthermore not as easy to grip as burlap bags due to their smoothness. (The South African Shipping News and Fishing Industry Review, May 1961.)



U. S. S. R.

FISHERY NEWS BRIEFS, JUNE 1961:

Soviet Exploratory Fishing Vessels Sighted in Gulf of Alaska: Soviet exploratory fishing vessels, which generally appear a year or two in advance of their organized fishing fleets, this year have been observed in the Gulf of Alaska off Kodiak Island and Yakutat. These vessels are believed to be forerunners of large Soviet fishing fleets operating north and south of the Aleutian chain.

U. S. S. R. Receives Herring Order From Japan: The Japanese this year placed an order for approximately 1,000 metric tons of salted herring with the Soviet Union's Far Eastern fisheries authority. The Japanese had been negotiating with Alaskans for the herring, but the Soviet bid was lower than anything that the Americans could quote. The price of the herring was reported at between \$80 and \$95 per metric ton, or an average of about 4½ cents per pound delivered to Hokkaido. The Soviets specified that the herring would be size graded with a minimum length of 10 inches. (Pacific Fisherman, May 1961.)

Soviets Fishing Off Cape Cod: U. S. S. R. fishing vessels in May 1961 were seen about 30 miles in the North Atlantic off Cape Cod. This is the first time Soviet fishing boats have been observed so close to the mainland of the continental United States east coast. In the late 1950's the Soviets began trawling in waters some distance from the northeastern Canadian coast primarily for ocean perch and cod. More recently, U. S. S. R. fishermen moved southward and were believed to be gill-netting for herring and whiting in the vicinity of Georges Bank. (Boston Traveler, May 23, 1961.)

High-Seas Fishery Expansion Continues: The Soviet mothership Iokhannes Vares processed 1,740 metric tons of herring and serviced 100 fishing vessels with supplies and technical assistance during a three-months period in the North Atlantic during 1960.

The Soviets are building: (1) a 14,000 gross-ton fish and crab processing vessel to be used in the North Pacific; (2) a 15,000 gross-ton herring factoryship; and (3) a 45,000 gross-ton whaling ship for service in the Antarctic. All three vessels are being built in Soviet shipyards and the herring and whaling ships are scheduled for completion during 1961.

Large freezer-trawlers of the Lyindas Girs type are under construction in Leningrad; these vessels have modern freezing facilities and equipment for manufacturing canned products and fish meal and oil.

The trend in Soviet high-seas fish processing is towards freezing and canning and away from salting, although salting is still second in importance to freezing. Frozen

U. S. S. R. (Contd.):

fish may be further processed on shore by canneries, smoking plants, or ready-made food plants. (The Fishing News.)

CRAB FISHING FLEETS IN BRISTOL BAY:

According to information received from the Japanese fleets operating in the Bristol Bay area in the Bering Sea, the Soviet Union's three crab fishing fleets are operating on a large scale in that same area.

Last year Russian fleets were operating in the same area, but according to information from the Japanese fleets, one more Russian fleet is operating this year with three motherships--one is 18,000 tons and two of 9,000 tons each. Judged on the number and capacity of the motherships, the Japanese estimate the Russian crab fishing fleets are able to catch and process several times what Japan's Tokai Maru crab fleet (jointly operated by three fishery companies) can catch and process.

In addition, four trawling fleets of the Soviet Union have also been reported operating in the same area. (Suisan Keizai Shimbun, June 18, 1961.)

SOVIET FISHING LIMITS AGREEMENT WITH BRITAIN TO END:

The British-Soviet fishing limits agreement, which allows British trawlers to fish up to three miles from the coast of Russia in certain areas of the Barents Sea, will end on March 12, 1962. This was announced in Moscow on June 30, 1961.

The agreement was implemented in March 1957, and was due to run for five years, with the provision that 12 months' notice would need to be given by either side to terminate it. The Soviets notified the British on March 2, 1961. Russia has given no specific reason for ending the agreement. The treaty would have been automatically extended for a further five years if neither party denounced it.

British trawlers will lose the right to fish to within three miles in two areas in the Barents Sea and will have to stay outside the

12-mile limit. (Fish Trades Gazette, July 8, 1961, and The Fishing News, July 7, 1961; both are British fishery periodicals.)



United Kingdom

FIBERGLASS TRAWLER UNDER CONSTRUCTION:

A trawler built entirely of fiberglass is under construction at Grimsby, England; it will also be the first Diesel-electric vessel to operate in Britain's middle-water fleet.

A break with tradition is made in the internal arrangements of the trawler; her engineroom is amidships, her fishing room aft of the engineroom, and crew accommodations under the foredeck.

The vessel has an over-all length of 130 feet 5 inches and a mean depth of 11 feet 4 inches. Her speed is expected to be 11 knots. Three Diesel engines of 440 B. hp. will drive the generators with an electric propulsion motor developing 800 hp. (Trade News, May 1961, Canadian Department of Fisheries.)

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority in May 1961 announced that, as a result of changes in the rates of interest charged to them by H. M. Treasury, their own rates of interest on advances made as from June 3, 1961, will be as follows:

Fishing vessels of not more than 140 ft., new engines, nets, and gear:

On loans for not more than 5 years, $5\frac{1}{2}$ percent; no change.

On loans for more than 5 years, but not more than 10 years, $6\frac{1}{4}$ percent; no change.

On loans for more than 10 years, but not more than 15 years, $6\frac{3}{4}$ percent; no change.

On loans for more than 15 years, but not more than 20 years, $6\frac{3}{4}$ percent; no change.

United Kingdom (Contd.):

Processing Plants:

On loans for not more than 15 years, $7\frac{1}{8}$ percent; increase $\frac{1}{8}$ percent.

On loans for more than 15 years, but not more than 20 years, $7\frac{1}{4}$ percent; increase $\frac{1}{4}$ percent.

The rates on advances made before June 3, 1961, are unchanged. (Fish Trades Gazette, June 17, 1961.)

Note: See Commercial Fisheries Review, May 1961 p. 65 and January 1961 p. 84.



Uruguay

TUNA FISHING CONDITIONS AND MARKETS:

The vessel Eikin Maru, 264 gross tons, operated by a large Japanese fishing company from Montevideo, Uruguay, completed its third tuna fishing trip in June 1961. According to reports, the fishing grounds off Uruguay abound with tuna and the Eikin Maru was able to catch 100 tons of tuna on a 30-day trip.

However, Uruguayans do not particularly seem to like tuna, and sales in Uruguay are disappointing, although this may be due to the lack of effective promotion. Yellowfin tuna make up over half of the catch, with some albacore and spearfish. The vessel price is around \$280 per metric ton for yellowfin, the same as export prices to Italy.

(Suisan Keizai Shimbun, June 30, 1961.)



West Indies

CONSTRUCTION OF JAPANESE TUNA CANNERY IN CURACAO:

A large Japanese fishing company has completed preliminary preparations for establishing a fishing base at Willemstad, Curacao, Netherlands Antilles, in the Caribbean Sea. Construction of a cannery was to start in August and is scheduled to be completed in May 1962. According to an earlier report, the company is also constructing a 1,500-ton capacity cold-storage plant and a fish-sausage plant in Curacao.

The Japanese firm is investing 530,000 guilders (US\$147,700) in the fishing base (authorized capital of 2,120,000 guilders or \$591,000). The Japanese firm is being granted a monopoly for 10 years by the Netherlands Government and is being exempted from paying taxes on materials. Korean and Communist Chinese currencies, in addition to United States and German currencies, are negotiable in Curacao and this should help operations.

Besides packing canned tuna, the firm plans to transship frozen tuna to the United States and to Europe from Curacao. Tuna unsuitable for export will be used for fish sausages. Because the port of Willemstad is an important port of call for a large number of freighters, frozen tuna can be shipped out without delay. (Suisan Keizai Shimbun, May 27 and July 8, 1961.)

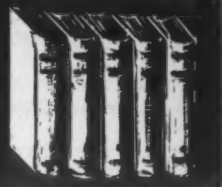


WHAT IS PLANKTON?

Plankton is a term of Greek origin used to describe all the various aquatic plants and animals, both marine and freshwater, which have little motility of their own. They are dependent principally on the tides and currents to transport them from place to place. While some animals classified as plankton have a certain ability to swim, such as some larval fish and certain jellyfishes, this matters little against the powers of oceanic tides and currents. The term nekton is used to describe animals, such as fish and squid, which are not planktonic and have the ability to swim. (Sea Secrets, The Marine Laboratory, University of Miami, Coral Gables, Fla.)



FEDERAL ACTIONS



Department of Commerce

BUREAU OF CENSUS

LIMITED REVISION OF IMPORT COMMODITY CLASSIFICATIONS IN 1962 PLANNED:

A limited revision of Schedule A, *Statistical Classification of Commodities Imported into the United States*, will be possible in 1962 in conjunction with the reprinting of Schedule A and the USIDA (*United States Import Duties Annotated*), which is necessary to reflect changes in rates of duties resulting from the 1960-1961 negotiations under GATT in Geneva and to correct and clarify reporting requirements in preparing import entry forms.

Since the principal objective of the revision of USIDA and any necessary corresponding changes in Schedule A will be the improvement of accuracy of the import statistics through the clarification of the reporting requirements, only a relatively low priority will be given to the work of changing the commodity classifications where such changes are not necessary to reflect the rate of duty changes. Users of the statistics are aware of the substantial errors which are occurring in the import statistics and will understand the desirability of stressing actions for improving accuracy. These actions may include the integration of excessive statistical details.

A release date for the issuance of the revised USIDA and Schedule A cannot be determined exactly until the results of the GATT negotiations are ready for announcement. For planning purposes, however, a tentative date of January 1962 has been set.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

EFFECTIVE DATE FOR FOOD ADDITIVES AMENDMENT EXTENDED:

A time extension for obtaining safety clearances for food additives was announced by the Food and Drug Administration in the *Federal Register* of June 30, 1961.

In the *Federal Register* of April 15, 1961, it was announced that all extensions of the effective date of the food additives amendment to the Federal Food, Drug, and Cosmetic Act

listed in §§ 121.86, 121.87, and 121.88 were to be continued until July 1, 1961, unless a regulation had been issued covering the subject matter of the extension or a regulation or further extension had been denied. It was also announced that legal action would not be instituted under the food additives amendment before July 1, 1961, involving the use of any food additive for which an extension request was pending before the Commissioner of Food and Drugs prior to March 6, 1961, unless the Commissioner had denied the request prior to July 1, 1961.

The Commissioner has before him a substantial number of requests for further extension of the effective date of the statute where it will not be possible to accomplish the necessary scientific review prior to July 1, 1961. Therefore, pursuant to section 6(c) of Public Law 85-929, 72 Stat. 1784, as amended, the time for considering such requests is extended to September 1, 1961.

* * * * *

EXTENSION OF EFFECTIVE DATE OF FOOD ADDITIVES STATUTE FOR CERTAIN SUBSTANCES USED DIRECTLY OR INDIRECTLY IN FOODS:

Additives Used in Paper Products for Food Packaging: The use in foods of certain additives as indirect additives for which tolerances have not yet been established or petitions therefor denied has been further extended under the most recent amendment of the Federal Food, Drug, and Cosmetic Act. The order issued by the U. S. Food and Drug Administration was published in the July 13, 1961, *Federal Register*, and became effective on July 3, 1961.

The order further extends the effective date of statute for about 40 substances as indirect additives to food. The effective date for some of the additives listed is extended to July 1, 1962, and for the others to July 1,

1963. Some of the substances include components of paper and paperboard for food packaging, components of lining for food containers, and components of adhesives, sizings, plasticizers, coatings, sizing agents, etc. The list of substances is in the regulations as "Part 121--Food Additives, Subpart A, section 121.91."

Direct Additives to Food: The same issue of the Federal Register contains an order (became effective June 30, 1961) listing about 38 substances as direct additives to food for which the effective date of the statute is further extended to July 1, 1962, for some and to July 1, 1963, for the others. None of the substances seem to be identified as any that are used in fishery products, however. The list is in the regulations as "Part 121--Food Additives, Subject A, section 121.90."

FOOD ADDITIVES USED IN CERTAIN FISHERY PRODUCTS APPROVED:

Certain substances or combinations used in several fishery products have been approved as additives by the U. S. Food and Drug Administration under section 409 of the Federal Food, Drug, and Cosmetic Act. In the two orders published in the July 13 Federal Register, the Agency points out that after having evaluated the data submitted in a petition filed by the company manufacturing the substances, as well as other relevant material, it has concluded that the food additives or combinations in question can be used safely as indicated in the order for certain specified food products, including certain fishery products.

The food additive calcium disodium EDTA may be safely used in designated foods, for the purpose and in accordance with the conditions prescribed in the order. It is used or intended for use in a number of food products including cooked canned crab meat (at 275 parts per million) and cooked canned shrimp (at 250 parts per million). It may be used with disodium EDTA (disodium ethylenediaminetetraacetate) or alone and with other combinations in dressings, sauces, and sandwich spreads.

The orders became effective on July 13, 1961, and as issued are incorporated in the regulations under "Part 121--Food Additives, subpart D, section 121.1017 and section 121.1056."

EXTENSION OF EFFECTIVE DATE OF STATUTE FOR ADDITIONAL SUBSTANCES USED INDIRECTLY IN FOODS:

The use in foods of additional additives as indirect additives for which tolerances have not yet been established or petitions therefor denied has been further extended under the most recent amendment of the Federal Food, Drug, and Cosmetic Act. The order issued by the U. S. Food and Drug Administration was published in the July 15, 1961, Federal Register, and became effective on July 3, 1961.

The order further extends the effective date of statute for an additional 42 substances as indirect additives to food. The effective date for the additives listed is extended to July 1, 1962. Some of the substances include paper coating adjuvants used in food packages, components of sizings and coatings, components of film for food packaging, lubricant in extruded food, etc. The list of substances is in the regulations as "Part 121--Food Additives, Subpart A, section 121.91."

ADDITIONAL FOOD ADDITIVES APPROVED:

Additional food additives used as chelating agents in paper and paperboard for food packaging and distilled acetylated monoglycerides used in food for human consumption have been approved for use by the U. S. Food and Drug Administration under section 409 of the Federal Food, Drug, and Cosmetic Act. In two orders published in the July 20, 1961, Federal Register, the Agency points out that after having evaluated the data submitted in petitions filed by the companies making the substances, as well as other relevant material, it has concluded that the food additives or combinations in question can be used as indicated in the orders.

The chelating agents used in the manufacture of paper and paperboard approved are sodium glucoheptonate, tetrasodium ethylenediaminetetraacetate, trisodium N-hydroxyethyl ethylenediamine triacetate, or any combinations of those substances.

The food additive distilled acetylated monoglycerides may be used safely in or on food in accordance with conditions prescribed in the order.

Both orders became effective on July 20, 1961, and were incorporated in the regula-

tions under "Part 121--Food Additives, Subpart F, section 121.2515" for the chelating agents and "Subpart D, section 121.1018" for the monoglycerides.

PUBLIC HEALTH SERVICE

FEDERAL ACTION TO CLEAN UP NEW YORK-NEW JERSEY RARITAN BAY AREA

Federal action to help clean up the Raritan Bay area in New York and New Jersey was announced on June 30, 1961, by the Surgeon General of the U. S. Public Health Service. The Surgeon General called a conference on the problem--which is the first step in enforcement procedures under the Federal Water Pollution Control Act of 1958--for August 22 and 23.

The Raritan Bay receives water from the Raritan River and the Arthurkill, both of which are heavily polluted and are unsuitable for many water uses.

New York and New Jersey closed the Raritan Bay area to clam harvesting when it appeared that raw clams had been taken from polluted areas of Raritan Bay. This was one of the factors that prompted the Service to call a conference on pollution.

Representatives of the official water pollution control agencies of New York and New Jersey and of the Interstate Sanitation Commission were asked to attend the conference.

In making the announcement, the Surgeon General said: "It ought to be clearly understood that the purpose of the conference is to deal with the broad problem of water pollution in this area, not solely with the effects of water pollution on clams. Harvesting of clams from these polluted waters was prohibited by the States of New York and New Jersey on May 1, 1961."

If suitable pollution abatement is not undertaken after the first conference, Federal procedures call for a public hearing before a specially-constituted board, and later, possible further enforcement action by the Department of Justice.



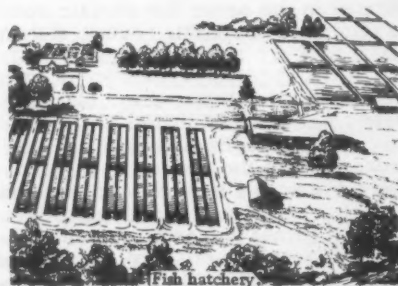
Department of the Interior

CONTRACT AWARDED FOR TRINITY RIVER SALMON HATCHERY IN CALIFORNIA:

A contract award opening the way for construction of a fish hatchery on California's Trinity River with a capacity of 45 million salmon and steelhead annually was announced by the Department of the Interior on July 29, 1961. The facility, part of the Central Valley Project, will be located downstream from the Lewiston Dam on the Trinity River.

It will have an annual capacity of 36 million king salmon, 4 million silver salmon, and 5 million steelhead fingerlings. Incorporating the latest design features, the hatchery will permit releases from the Lewiston and Trinity Dams in an Interior Department program to help maintain downstream spawning in the Trinity River. The hatchery will be operated by the State of California Department of Fish and Game.

This program will materially assist in maintaining Trinity River sports fishing as well as benefitting Pacific Coast commercial salmon fishing. Contract for the hatchery, the Commissioner of Reclamation reported, was awarded to the E-W. Construction Co., of Creswell, Oregon, on its bid of \$1,200,261. The contract calls for construction of four hatchery buildings, a fish ladder, holding tanks, nursery and rearing ponds, and other facilities. Completion within 375 days is required.



Plans for the hatchery followed several years of investigation conducted by the U. S. Fish and Wildlife Service and the State of California which conducted an inventory of fish runs that would be affected by dam construction on the Trinity River.

As another part of the Interior Department fish conservation program, construction is

scheduled for the 190-foot Spring Creek Diversion Dam designed to correct water pollution that has taken a heavy toll of fish life in the upper Sacramento River. The dam also will protect the Spring Creek Power Plant from floating debris.

Trinity Dam began storing water for the first time this year and is providing excellent boating as well as good fishing. New public campgrounds have been provided by the Bureau of Reclamation on the shores of the reservoir, now at 40 percent capacity, in Trinity National Forest.

SCIENCE ADVISOR TO SECRETARY APPOINTED:

Dr. Roger Revelle, of La Jolla, Calif., has been appointed Science Advisor to the Secretary of the Interior, Secretary Stewart L. Udall announced on July 12, 1961.

Dr. Revelle, who is on a leave of absence from his post as director of the University of California's Scripps Institution of Oceanography, will serve as the principal science advisor to the Secretary and will coordinate the several scientific programs of the Department.



Dr. Roger Revelle.

In announcing the appointment, Secretary Udall said: "Doctor Revelle will be the first science advisor in the history of the Department of the Interior. We are very pleased that a scientist of his broad experience and distinguished position in the scientific community has accepted this appointment.

"I am anxious that the Office of the Science Advisor shall exert a maximum influence on the policies and programs of the Department. In addition to acting for me in all scientific matters within Interior, he will represent this Department on the Federal Council for Science and Technology, and in other inter-departmental agencies for coordinating the scientific activities of the Government."

Born in Seattle, Washington, on March 7, 1909, Dr. Revelle received his A. B. degree in geology from Pomona College in 1929 and his Ph. D. in oceanography from the University of California in 1936. He has been professor of oceanography at the University's Scripps Institution of Oceanography since 1948 and its director since 1950. For the past several years, he has also been director of the La Jolla campus and dean of the University's School of Science and Engineering at La Jolla.

During World War II, he served as a Commander in the U.S. Navy. Immediately after the war, he was head of the Geophysics Branch, Office of Naval Research. He also served as a staff member of Operations Crossroads, the 1946 atomic test at Bikini.

One of the country's leading geophysicists Dr. Revelle has led several oceanographic exploring expeditions into the south and west Pacific, and is one of the authors of modern theories of the structure of the earth underneath the oceans.

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

ALASKA REGIONAL OFFICE POSITIONS FILLED:

Promotions to two positions in the Alaska Regional Office of the U. S. Bureau of Commercial Fisheries were reported on July 3, 1961.

Frank T. Piskur, Director of the Fishery Technological Laboratory at College Park, Md., is the new Assistant Regional Director in the Regional Office in Juneau, Alaska. His appointment was effective June 25. Piskur is a graduate of the University of Illinois. From 1941 to 1944, he worked for the Fishery Experimental Commission in Ketchikan, Alaska. He has been with the Bureau since 1944. He has held positions of responsibility in various Bureau technological laboratories. Piskur fills the vacancy made in October 1960 when Harry L. Rietze was promoted from Assistant Regional Director to Regional Director.

Henry C. Scudder, currently an area fishery administrator in Alaska, has been named Assistant to the Regional Director in Juneau. The appointment was likewise effected June 25. Scudder first came to the Bureau of Commercial Fisheries in 1914 in temporary employment in Manchester, Iowa. On July 1,

1916, he received his first permanent appointment with the Bureau as a warden on the Pribilof Islands. He remained on the Pribilofs except for a time in the Army, in 1918, until 1923, when he resigned to spend 20 years in private industry. From 1943 to 1950 he was in fishery management positions with the Bureau in Craig and Juneau, Alaska. After four years with the Bureau of Indian Affairs, also in Alaska, he returned to the Bureau as Fishery Management Biologist in Ketchikan and later in Juneau. He went to his present position as Area Administrator in March of this year.

FEDERAL STANDARD PROPOSED FOR GRADES OF FROZEN FRIED BREADED SEA SCALLOPS:

A proposed standard for grades of frozen fried breaded sea scallops was announced in the July 20, 1961, Federal Register. The proposed standard, if made effective, will be the first issued by the U. S. Bureau of Commercial Fisheries prescribing Government standards for frozen fried scallops.

The proposed standard points out that frozen fried scallops are prepared from the whole or cut adductor muscles of the sea scallop (*Placopecten magellanicus*), or scallop units cut from a block of frozen sea scallops, that are coated with wholesome batter and breading and precooked in oil or fat, and then packaged and frozen. They contain a minimum of 60 percent by weight of scallop meats.

As published, the proposed standard describes the product, styles of pack, grades, factors of quality (ascertaining the grade; evaluating the unscored factor of flavor and odor; evaluating and rating the scored factors of appearance, uniformity, absence of defects and character; appearance; uniformity; absence of defects; and character); definitions and methods of analysis; and lot certification tolerances.

Interested persons had until August 19, 1961, to submit written comments, suggestions, or objections on the proposed standard.

OCEANOGRAPHIC AND HAWAII AREA DIRECTOR POSTS FILLED:

Vernon E. Brock, who has been area director of the U. S. Bureau of Commercial

Fisheries for the Hawaii Area, has been named laboratory director of the Bureau's Biological Laboratory at Washington, D. C., and will serve as principal Bureau advisor for oceanographic research, the Department of the Interior announced on July 27, 1961.

Succeeding him as Area Director for Hawaii is John C. Marr who has been laboratory director of the Bureau's Biological Laboratory at Honolulu.



Vernon E. Brock

In addition to his advisory role, Brock represents the Bureau in the development and coordination of the National Oceanographic Program. The Washington Laboratory carries out fishery oceanographic research programs in the Atlantic and, as its Director, he will be responsible

for the development of a fishery and oceanographic research plan for a high-seas survey of the equatorial Atlantic from South America to the African coast.

Brock, a native of Fillmore, Calif., is a graduate of Stanford University with a Master's Degree. Before becoming Area Director, Brock was Director and Assistant Director of the Bureau's Pacific Oceanic Fishery Investigations at Honolulu. From 1944 to 1958, he was Director of the Division of Fish and Game of the Territory of Hawaii. Earlier he was employed as Chief Biologist by the Fish Commission of Oregon.



John C. Marr

Marr, who will now administer the Bureau of Commercial Fisheries research and industry-services programs in the Hawaii area, is a native of Oakland, Calif. He graduated from Pasadena Junior College and received A.B. and M.A. degrees in fisheries biology from Stanford University. His first

employment with the Fish and Wildlife Service was as a junior biological aid while at Stanford.

After receiving his Master's Degree, he worked for the California Division of Fish and Game and the Office of Coordinator of Fisheries. Since 1946, he has been in the employ of the U. S. Fish and Wildlife Service, engaged in biological research--first at the Stanford University Laboratory and then at La Jolla, Calif., before going to Hawaii.



Department of State

FRANK P. BRIGGS SWORN IN AS U. S. COMMISSIONER ON NORTHWEST ATLANTIC FISHERIES COMMISSION:

Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, was sworn in as U. S. Commissioner on the International Commission for the Northwest Atlantic Fisheries on July 5, 1961.



Frank P. Briggs

Briggs, a newspaper publisher and former U. S. Senator, has, in addition to holding other public offices, been a member of the Missouri Conservation Commission since 1947, and served four terms as its Chairman.

The International Commission for the Northwest Atlantic, on which Briggs is one of three U. S. Commissioners, was established in 1951 pursuant to a Convention which entered into force July 3, 1950. At the eleventh annual meeting of the Commission, held in Washington June 5-10, 1961, the 12 member nations were represented by a total of some 70 Commissioners and advisors. These countries, all having a fishing interest in the area of the Northwest Atlantic Ocean, are: Canada, Denmark, France, Germany, Iceland, Italy, Norway, Portugal, Spain, U.S.S.R., United Kingdom, and the United States.

The purpose of the Convention is to enable the member Governments to take joint action in the conservation of stocks of fish in the Northwest Atlantic Ocean. As part of that joint action, the Commission, meeting annually, plans, coordinates, and reviews programs of fishery research which are conducted by the individual member nations. If, after adequate research, regulatory measures are found to be desirable, the Commission recommends the adoption of such regulations to the Member Governments. In the 11 years of its existence the Commission has notably stimulated the growth of knowledge of the fisheries of the area and the measures necessary for their wise utilization.

This is one of eight international fishery commissions in which the United States participates with 22 other countries in the conservation of the fishery resources of the high seas.



Department of the Treasury

COAST GUARD

UNDOCUMENTED BOAT NUMBERING REQUIREMENTS ISSUED:

Rules to define and clarify the intent of the identification requirements for numbered boats or undocumented vessels were issued by the U. S. Coast Guard and published in the June 27, 1961, Federal Register. The Coast Guard is charged with the general supervision of the administration and enforcement of the Federal Boating Act of 1958, and the act of April 25, 1940, as amended.

One section of the act requires the display of identification numbers on certain undocumented vessels. The numbers required to be displayed on boats are intended to provide ready identification of the boat. Such identification numbers must be at least 3 inches high, of block character of good proportion, and of a color that contrasts with the background color to which such characters are affixed so that they can be seen and read easily. The law and regulations place the responsibility for meeting these requirements upon the boat owner. All owners of numbered boats shall comply with the vessel identification requirements.

The June 27 Federal Register designates the rules established by the Coast Guard with

regard to numbering of boats under 46 CFR 171.05-2 and 171.05-6. The rules cover arrangement of number placed on the vessel and definitions of terms used. The effective date was June 27, 1961.

FOREIGN ASSETS CONTROL

U.S. BAN LIFTED ON IMPORTS OF SHRIMP FROM HONG KONG:

Shrimp appropriately certified by the Hong Kong Government may again be imported into the United States under the general license contained in Section 500.536 (c) of the Foreign Assets Control Regulations. As of June 17, 1961, revised procedures for the certification of shrimp from Hong Kong were agreed upon. The first shipments under the new procedure were to be made in August 1961.

Under the Foreign Assets Control Regulations, the importation of Communist Chinese products is not authorized. The Hong Kong certification procedures for shrimp were established for the purpose of ensuring that Communist Chinese shrimp would not be exported from Hong Kong to the United States. When it became evident that frozen shrimp of Communist Chinese origin were in fact being imported under cover of certificates of origin, the procedures were immediately suspended (sometime in 1959). After an investigation of the situation by the Hong Kong authorities the procedures were revised to include stricter requirements which are believed will effectively prevent further shipments of Communist Chinese shrimp from being imported into the United States from Hong Kong. (Letter dated July 18, 1961, from Acting Director, Foreign Assets Control, U.S. Treasury Department.)

The lifting of the ban was announced in the Federal Register of July 21, 1961, as follows:

Foreign Assets Control IMPORTATION OF FRESH FROZEN SHRIMP DIRECTLY FROM HONG KONG

Available Certifications by the Government of Hong Kong

Notice is hereby given that with the reinstatement, as of June 17, 1961, of the certification procedures entitled, "marine products, fresh frozen," certificates of origin issued by the Department of Commerce and Industry of the Hong Kong Government under procedures agreed upon between that Government and the Foreign Assets Control are again available for fresh frozen shrimp.

(SEAL) MARGARET W. SCHWARTZ,
Acting Director,
Foreign Assets Control.

Note: See Commercial Fisheries Review, Nov. 1959 p. 97.

U. S. Circuit Court

FISHING CREWS UNEMPLOYMENT AND SOCIAL SECURITY TAX EXEMPTION UPHOLD:

The United States Fifth Circuit Court of appeals in New Orleans, La., in July 1961 ruled that the Internal Revenue Bureau cannot levy social security and unemployment compensation taxes against fishery products packers for vessel captains and crewmen who work as independent contractors.

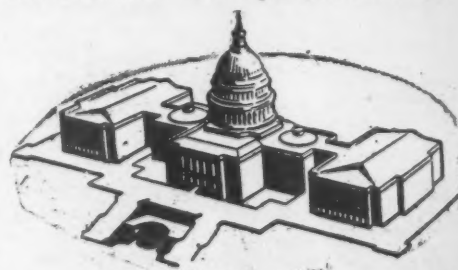
The majority opinion by a three-judge panel upheld a 1959 decision of Federal District Judge Sidney Mize in the case of J. L. Enochs, District Director of Internal Revenue, vs. Williams Packing and Navigation Co., Inc. at Biloxi, Mississippi.



Eighty-Seventh Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction,



referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.

AMERICAN SAMOA FISHERIES: S. Doc. No. 38, Study Mission to Eastern (American) Samoa (July 17, 1961 Report of Senators Oren E. Long of Hawaii, and Ernest Gruening of Alaska to the Committee on Interior and Insular Affairs, United States Senate, pursuant to S. Res. 330, 86th Congress), 192 pp. printed. Chapter V—"Industry and Business to Broaden the Economic Base," discusses American Samoa exports of fishery products, the fisheries industry, possible expansion of fish industry, Samoa fishing fleet possibility, and pond fisheries.

CATCH TRANSFER AT SEA: On July 19, Subcommittee on Fisheries and Wildlife Conservation of House

Committee on Merchant Marine and Fisheries met on H. R. 682. Would legalize transferring of the catch of one fishing vessel to another on the high seas, and transporting it without charge to a United States port. Interior Department officials and various Congressmen presented testimony. Hearings were concluded. On July 27, the Subcommittee met in executive session and ordered reported to full committee S. 1222, companion bill to H. R. 682. Committee tabled H. R. 682.

On August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported S. 1222. On August 3, the Committee reported to the House S. 1222 (H. Rept. 840); referred to Committee of the Whole House on State of the Union.

H. Rept. No. 840, Relating to Documentation and Inspection of Vessels of the United States (Report from Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 87th Congress, 1st Session, to accompany S. 1222), 5 pp., printed. Committee reported bill favorably without amendments and recommended passage. Contains purpose of bill, background, and need for legislation, and departmental reports from Department of Commerce, Department of the Interior, and Department of the Treasury.

FEDERAL BOATING ACT OF 1958 AMENDMENTS: On August 8, S. 883, an act to extend the application of the Federal Boating Act of 1958 to the Commonwealth of Puerto Rico, the Virgin Islands, and Guam, without amendment, was reported out from House Committee on Merchant Marine and Fisheries (H. Rept. No. 861). Was placed on proper calendar and referred to the Committee of the Whole House on the State of the Union.

H. Rept. No. 861, Applying Federal Boating Act of 1958 to Puerto Rico, Virgin Islands, and Guam (Report from the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 87th Congress, 1st Session, to accompany S. 883), 4 pp., printed. Committee reported bill favorably without amendment and recommended passage. Contains purpose of the bill, Executive Communication No. 487, reports of the Departments of Interior and Treasury, and cites changes in existing law.

FEDERAL TRADE COMMISSION ACT AMENDMENT: S. J. Res. 121 (Capehart et al), introduced in Senate July 31, a joint resolution to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm and define the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; to Committee on Commerce.

FISH HATCHERY: H. R. 8371 (Evins), introduced in House on July 27, a bill to authorize the Secretary of the Interior to establish, construct, equip, operate, and maintain a fish hatchery in DeKalb County, Tenn.; to the Committee on Merchant Marine and Fisheries.

FISHERY LOAN FUND MORTGAGE FORECLOSURE: On July 19, Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met on H. R. 206, a bill to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956. Would give Interior Secretary authority to dispose of property acquired through foreclosure of vessel mortgages under the loan fund. Witnesses from Department of Interior were heard. Hearings were concluded. On July 27, the Subcommittee met in executive session and ordered reported to full committee H. R. 206.

On August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported H. R. 206. On August 3, the Committee reported to House H. R. 206. Referred to Committee of the Whole House on State of the Union.

H. Rept. 845, Facilitating Administration of the Fishery Loan Fund Established by the Fish and Wildlife Act of 1956 (Report of the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 87th Congress, 1st Session, to accompany H. R. 206), 3 pp., printed. Committee reported bill favorably without amendment and recommended passage. Report presents purpose of bill, need for the legislation, cost of legislation, and departmental report.

FOREIGN-FLAG VESSELS TO LAND CATCH OF FISH IN VIRGIN ISLANDS: On July 19, Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met on H. R. 3159, a bill to permit certain foreign-flag vessels to land their catches of fish in the Virgin Islands in certain circumstances. Testimony of a Congressman and various officials of the Interior Department were heard. Hearings were concluded. On July 27, the Subcommittee met in executive session and ordered reported to full committee H. R. 3159.

On August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported H. R. 3159. (H. Rept. 830).

H. Rept. No. 830, Permitting Certain Foreign-Flag Vessels to Land Their Catches of Fish in the Virgin Islands in Certain Circumstances (Report from the Committee on Merchant Marine and Fisheries, House of Representatives, 87th Congress, 1st Session, to accompany H. R. 3159), 5 pp., printed. Committee reported bill favorably without amendments and recommended passage of bill. Report presents background of legislation, its purpose, need for legislation, departmental reports, and changes in existing law.

On August 7, the House passed H. R. 3159, and sent bill to Senate.

On August 8, the House-passed bill, H. R. 3159, was received in Senate and referred to Committee on Commerce.

GULF OF MEXICO OUTER CONTINENTAL SHELF RESTRICTIONS: On July 19, the House Committee on Interior and Insular Affairs met on H. R. 6745, re Matagorda Water Range, and H. R. 6849, re Corpus Christi Offshore Warning Area. Would restrict mineral leasing in large sections of areas named but as proposed would not impair rights of commercial fishermen. Also met on July 26.

IMPORT COMPETITION ADJUSTMENT: H. R. 8542 (Bates), introduced in House August 7, a bill to provide for adjusting conditions of competition between certain domestic industries and foreign industries with respect to the level of wages and the working conditions in the production of articles imported into the United States; to the Committee on Ways and Means. Identical to H. R. 757 (Mrs. St. George).

INTERIOR DEPARTMENT APPROPRIATIONS, FY 1962: House on July 25 disagreed to Senate amendments to H. R. 6345, appropriations for the Department of the Interior and related agencies (includes funds for Fish and Wildlife Service and its two Bureaus); agreed to a conference with the Senate; and appointed conferees.

Senate conferees were appointed several weeks earlier. Conferees met in executive session on July 26.

On July 26, the Conferees, in executive session, agreed to file a conference report (H. Rept. No. 797), on the differences between the Senate- and House-passed versions of H. R. 6345, fiscal 1962 appropriations for the Department of the Interior. The Committee on Conference agreed to recommend to their respective Houses various amendments. Those pertaining to the Bureau of Commercial Fisheries are: Amendment No. 14: Appropriates \$12,150,000 for management and investigations of resources instead of \$11,700,000 as proposed by the House, and \$12,225,000 as proposed by the Senate. The increase provided over the House bill is for the following: research to improve the efficiency of blue crab plant operations, \$100,000; research on shrimp resources in the Gulf of Mexico, \$175,000; time-temperature tolerance study on frozen fish and shellfish, \$30,000; investigations into the effect control techniques have on shellfish, \$30,000; research on the manufacture and use of fish protein concentrate, \$50,000; and the fishery research program for the rice areas, \$65,000. Amendment No. 16: Deletes contract authority of \$700,000 for management and investigations of resources (special foreign currency program) inserted by the Senate for research contracts in foreign areas. The conferees agree that it is not intended to limit this program to a single year assuming that effective results are obtained with the direct appropriation of \$300,000 carried in the bill for fiscal year 1962.

For the Bureau of Sport Fisheries and Wildlife, the Committee recommended: Amendment No. 18: Appropriates \$23,315,650 for management and investigations of resources instead of \$23,000,000 as proposed by the House and \$23,972,000 as proposed by the Senate. Amendment No. 19: Appropriates \$5,257,500 for construction instead of \$3,770,000 as proposed by the House and \$5,350,650 as proposed by the Senate.

The conference report to the bill was presented to the House on July 26, but not to the Senate.

On July 27, by a voice vote the House adopted the conference report on H. R. 6345, Interior Appropriations for fiscal year 1962, and sent the legislation to the Senate.

Conference Committee report was reported to the Senate on July 27, which adopted the conference report and cleared the legislation for the President.

For the Bureau of Commercial Fisheries, the Budget estimate was \$21,839,000; House allowance was \$20,793,000; Senate allowance was \$21,318,000; Committee on Conference allowance is \$21,243,000. As passed the total appropriation of \$21,243,000 provides \$12,150,000 for management and investigation of resources (\$75,000 less than the higher Senate allowance); and the same as the House and Senate allowance for the special foreign currency program (\$300,000), construction (\$7,561,000), general administrative expenses (\$482,000), and construction of fishing vessels (\$750,000). In addition, the Bureau has \$1,981,000 from indefinite appropriation of receipts for administration of the Pribilof Islands and \$250,000 for administrative expenses for the fisheries loan fund. In fiscal year 1961 the appropriation was \$11,490,000 plus \$2,070,000 for Pribilof Islands and \$250,000 for fisheries loan fund. However, FY 1962 funds include \$1,915,000 transfer from Corps of Engineers for Columbia River fishery facilities and includes budget amendment increases of \$2,500,000 in H. Doc. 113 (Amendments to the Budget for Fiscal Year 1962), and \$1,431,000 transfer for construction of Columbia River fishery facilities.

For Bureau of Sport Fisheries and Wildlife, bill as passed by Congress provides \$29,644,150 as compared to \$30,393,650 allowed by the Senate, and compared to \$25,459,000 appropriated for FY 1961.

For Office of Commissioner of Fish and Wildlife, the bill as passed provides \$364,000, the same as allowed by Senate and House, and the same as appropriated for FY 1961. The grand total provided for the Fish and Wildlife Service (includes the two Bureaus and Commissioner) by the bill as passed was \$51,251,150 for fiscal year 1962 as compared with \$37,313,000 in FY 1961, plus funds for administration of Pribilof Islands and fisheries loan fund.

H. Rept. 797, Making Appropriations for the Department of the Interior and Related Agencies (July 26, 1961), Report of Committee of Conference, House of Representatives, 87th Congress, 1st Session, to accompany H. R. 6345, 10 pp., printed. Contains recommendations of the Committee of Conference on the disagreeing votes of the two Houses on the amendments of the Senate to H.R. 6345.

On August 1, the Committee on House Administration reported that H. R. 6345 was presented to the President for his approval.

On August 3, H. R. 6345, fiscal 1962 appropriations for the Department of the Interior was signed by the President (P. L. 87-122).

KING AND SILVER SALMON ADVISORY COMMITTEE: H. R. 8215 (Mrs. Hansen), introduced in House July 18, a bill to establish an advisory committee on king and silver salmon, and for other purposes; to the Committee on Merchant Marine and Fisheries. Identical to H. R. 7595 (Clem Miller).

LABOR, HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS: H. R. 7035 (Hill), introduced in House May 18, 1961, a bill making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1962, and for other purposes. Funds are provided in the amount of \$1,820,000 for construction, equipping, staffing, and operating two shellfish laboratories, one on the East Coast and one on the Gulf Coast, to combat the danger of transmission of disease, such as hepatitis, from raw shellfish to humans; shellfish sanitation; and grants for shellfish research. Was reported (H. Rept. 392) from House Committee on Appropriations on May 15, and passed House May 17. Was reported in Senate (S. Rept. 618) on July 25. On August 1, the Senate considered H. R. 7035, adopted en bloc all committee amendments, which were thereafter considered as original text for purpose of further amendment.

Departments of Labor and Health, Education, and Welfare Appropriations for 1962, Department of Health, Education, and Welfare Part 2--Public Health Service (Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, Eighty-Seventh Congress, First Session), 1,210 pp., printed. Contains funds for research grants for shellfish technology and marine ecology; shellfish sanitation; and for the establishment of Public Health Service shellfish sanitation laboratories on the Gulf and Northeast coasts.

H. Rept. 392, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1962 (87th Congress, 1st Session, Report from the Committee on Appropriations, to accompany H. R. 7035), 58 pp., printed. Bill includes funds in amount of

\$1,820,000 to establish and operate two shellfish laboratories, one on the East Coast, and one on the Gulf Coast.

Labor-Health, Education, and Welfare Appropriations for 1962 (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, Eighty-Seventh Congress, First Session, on H. R. 7035, a bill making appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1962, and for other purposes), 1,719 pp., printed. Contains a section of Public Health Service recommendations regarding "Milk Food, Interstate, and Community Sanitation Activity." This section concerns food-borne infections and food poisoning, including increasing pollution of shellfish-growing waters; shellfish problem; import problems on shellfish; and importation of Russian crab meat. Contains resolution from the Conference of State Sanitary Engineers, Atlanta, Ga., regarding certification of shellfish; recommendations of the Association of State and Territorial Health Officers, San Francisco, Calif., regarding shellfish sanitation, certification of foreign sources of shellfish; statement of position of executive board Conference of State Sanitary Engineers, relative to Public Health Service Shellfish Sanitation Research; letters from the Oyster Institute of North America, Alabama Departments of Public Health and Conservation, and Rhode Island Department of Health; and a report on spread of hepatitis from shellfish. Also includes discussion on fish flour; chemicals used as food additives; color additives in foods, drugs, and cosmetics; and misuse of pesticides.

S. Rept. No. 618, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1962 (87th Congress, First Session, United States Senate, Report of Committee on Appropriations, to accompany H. R. 7035), 72 pp., printed. Funds are provided in the amount of \$1,820,000 for construction, equipping, staffing, and operating two shellfish laboratories, one on the East Coast and one on the Gulf Coast, to combat the danger of transmission of disease, such as hepatitis, from the raw shellfish to humans.

On August 2, the Senate passed with amendments H. R. 7035, Senate insisted on its amendments, asked for conference with House and appointed conferees.

On August 3, an objection was made in the House to H. R. 7035 going to conference. Senate passed bill with \$883 million additional funds, as compared with action of the House of Representatives.

MARINE MAMMAL HIGH SEAS PROTECTION: On August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported H. R. 7490, for the protection of marine mammals on the high seas.

On August 8, H. R. 7490 was reported out from House Committee on Merchant Marine and Fisheries (H. Rept. No. 865). Was placed on proper calendar and referred to the Committee of the Whole House on the State of the Union.

H. Rept. No. 865, Protection of Marine Mammals on the High Seas (Report from Committee on Merchant Marine and Fisheries, U.S. House of Representatives, 87th Congress, 1st Session, to accompany H. R. 7490), 8 pp., printed. This legislation was originally introduced as H. R. 777, and after hearings, the "clean" bill, H. R. 7490, was introduced. Most of the changes are those advocated in the reports of various departments. Com-

mittee regards the bill as necessary for the preservation of the particular species and recommends its enactment. Contains purpose of bill, background and need for the legislation, cost of legislation, departmental reports from the Departments of Interior, Justice, Treasury, and State.

NATIONAL FISHERIES CENTER AND AQUARIUM: S. 2296 (Engle), introduced in Senate July 24, a bill to authorize the Secretary of the Interior to construct a National Fisheries Center and Aquarium in the District of Columbia; to Committee on Public Works. Identical to H. R. 8181 (Kirwin).

NORTHWEST ATLANTIC FISHERIES CONVENTION: On July 27, a declaration of understanding regarding the International Convention for the Northwest Atlantic Fisheries, signed at Washington, D.C., April 24, 1961 (Ex. M. 87th Cong., 1st Sess.), was received in Senate and referred to Senate Committee on Foreign Relations.

OCEANOGRAPHIC RESEARCH PROGRAM: On July 27, the Senate considered S. 901, to establish a comprehensive 10-year program of oceanographic research and surveys, agreeing by unanimous consent that on July 28, further debate on the bill was limited to 2½ hours. Committee amendments were adopted en bloc, and bill was thereafter considered as original text for purpose of further amendment. Senate adopted Magnuson amendment respecting authorized appropriations for various Government activities to carry out functions under the bill, and Gruening amendments to add Arctic Ocean and Bering Sea to areas where additional programs relating to physical oceanography may be carried out.

On July 28, by 50 yeas to 32 nays (motion to reconsider tabled), the Senate passed with amendments S. 901, after adopting two further amendments as follows: Smith (Maine) amendment to require Budget Bureau to furnish exact accounting to Congress each year of funds spent; and Long (Louisiana), amendment barring use of funds for technological research or development unless results are made available to the public. On July 31, the House received S. 901; referred to Committee on Merchant Marine and Fisheries.

Also, on July 31, the Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries considered but took no final action on H. R. 4276, to establish a National Oceanographic Council consisting of certain designated Federal officials to create a National Oceanographic Data Center and a National Instrumentation Test and Calibration Center.

OCEANOGRAPHIC RESEARCH VESSELS: H. R. 8463 (Geo. P. Miller) and H. R. 8476 (Morrison), introduced in House August 2, bills to require that title to certain vessels supplied directly or indirectly by the United States for oceanographic research shall remain in the United States, and for other purposes; to Committee on Merchant Marine and Fisheries. Identical bill introduced on August 7, H. R. 8541 (Thompson of La.).

POLLUTION OF SEA TREATY IMPLEMENTATION: On July 20, the Subcommittee on Coast Guard, Coast and Geodetic Survey, and Navigation of House Committee on Merchant Marine and Fisheries held a hearing on H. R. 8152, bill to implement the provisions of the International Convention for the Prevention of the Pollution of the Sea by Oil, 1954. Various government and public witnesses were heard.

On July 31, the Merchant Marine and Fisheries Subcommittee of the Senate Committee on Commerce held and concluded hearings on S. 2187, companion bill to H. R. 8152. Testimony of the Assistant Secretary of Interior for Fish and Wildlife, the Director of the Bureau of Sport Fisheries and Wildlife, and another official from that bureau was heard.

On August 1, the Senate Committee on Commerce in executive session ordered favorably reported S. 2187. Also on August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered reported favorably H. R. 8152 (amended), the companion House bill on the same subject.

On August 2, the House Committee on Merchant Marine and Fisheries reported to the House H. R. 8152 with amendment (H. Rept. No. 838); referred to Committee of the Whole House on the State of the Union.

H. Rept. No. 838, Implementing the Provisions of the International Convention for the Prevention of the Pollution of the Sea by Oil, 1954 (Report of Committee on Merchant Marine and Fisheries, House of Representatives, 87th Congress, 1st Session to accompany H. R. 8152), 9 pp., printed. Committee reported bill favorably with amendments, and recommended passage of bill. Contains purpose of bill, need for the legislation, amendments, and departmental reports. The bill as introduced, and the Convention differ in the percentage of oil to water mixture; the Committee adopted language of convention. Also, the bill, as introduced did not specify areas subject to terms of the convention, and did not provide for maintenance or record books. As suggested by Department of State and the Coast Guard, these schedules were inserted in the bill. Bill would make no changes in existing law.

On August 4, the Senate Committee on Commerce reported out with amendments S. 2187 (S. Rept. No. 666).

S. Rept. No. 666, Pollution of the Sea by Oil (Report of Committee on Commerce, U. S. Senate, 87th Congress, 1st Session, to accompany S. 2187), 10 pp., printed. Committee reported bill favorably with amendments and recommended passage. Contains a general discussion, the text of Convention, the legislation, reservations, amendments, need for legislation, the position of the shipping industry, and departmental reports. An amendment to section 2(a) is to make uniform the definition of "oil" in the bill and the convention. Also, the addition of two new sections would amend the bill so as to describe the prohibited zones, and information required by the oil-record book. There are no changes in existing law.

SHELLFISHERIES RESEARCH CENTER: On July 19, Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met on H. R. 2894, a bill to provide for the construction of a shellfisheries research center at Milford, Conn. Testimony of a Congressman and various officials of the Interior Department were heard. Hearings were concluded. On July 27, the Subcommittee met in executive session and ordered reported to full committee H. R. 2894.

On August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported S. 606. On August 3, the Committee reported to House S. 606 (H. Rept. 846) without amendment. Referred to Committee of Whole House on the State of the Union.

H. Rept. No. 846, Providing for the Construction of a Shellfisheries Research Center at Milford, Conn. (Report from the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 87th Congress, 1st Session, to accompany S. 606), 3 pp., printed. Committee reported bill favorably without amendment and recommended passage. Contains purpose of bill, background and need for the legislation, cost of legislation, and departmental report.

SHRIMP IMPORT DUTIES: H. R. 8531 (Faseell), introduced in House August 7, a bill to amend the Tariff Act of 1930 to impose a duty on shrimp and to provide for duty free entry of unprocessed shrimp annually in an amount equal to imports of shrimp in 1960; to the Committee on Ways and Means. Also, on August 8, the House Committee on Ways and Means held hearings on H. R. 8168, and related bills.

On August 8, a resolution of the House of Representatives of the State of Texas was received in Senate, petitioning the Congress of the United States and the departments of the executive branch to "exert their best efforts to bring about a measure of stability to the domestic shrimp market by a regulation of imports of shrimp so that the domestic shrimp industry may survive and prosper, giving employment to Americans, utilizing fully this valuable natural resource, and preserving and maintaining the individual and independent seamen and producers who wrest their living dangerously from the sea;" to the Committee on Finance. Also, on August 8, the House Committee on Ways and Means held and concluded hearings on H. R. 8168, and related bills.

SMITHSONIAN INSTITUTION MARINE AND AQUATIC BIOLOGICAL RESEARCH: H. R. 8401 (Geo. F. Miller), introduced in House July 31, a bill to authorize expanded programs of marine and aquatic biological research by the Smithsonian Institution, and for other purposes, to Committee on House Administration.

STATE DEPARTMENT APPROPRIATIONS, FY 1962: On July 31, a subcommittee of the Senate Committee on Appropriations resumed, in executive session, its hearings on H. R. 7371, fiscal 1962 appropriations for the Departments of State and Justice, and Judiciary. Includes funds for International Fisheries Commissions. On August 2, the subcommittee, in executive session, met to mark up H. R. 7371.

On August 3, the Senate subcommittee of the Committee on Appropriations in executive session, marked up and ordered favorably reported to the full committee with amendments H. R. 7371.

SUPPLEMENTAL APPROPRIATIONS, FY 1962: H. Doc. No. 210, Proposed Supplemental Appropriations and a Budget Amendment Involving a Reduction in the Estimate of the Department of State, 87th Congress, 1st Session (July 13, 1961, proposed supplemental appropriations in the amounts of \$153,532,000 for fiscal year 1962 and \$6,831,000 for fiscal year 1961 and prior years, and a budget amendment involving a reduction of \$2,843,000 in the estimate of the Department of State), 13 pp., printed. For the Bureau of Commercial Fisheries, includes \$800,000 for research on fish passage over dams.

TARIFF CLASSIFICATION RESTATEMENT IN TARIFF ACT OF 1930: On July 28, a letter from the Secretary of the Treasury was received in Senate, transmit-

ting a draft of proposed legislation to amend the Tariff Act of 1930, and certain related laws to provide for the restatement of the tariff classification provisions, and for other purposes (with accompanying papers); to the Committee on Finance. Would establish legislative method for bringing the revised Tariff Schedules into effect as recommended by the U. S. Tariff Commission. The proposed new tariff classification provisions are organized into 8 schedules (instead of 16), with provisions of general application, principles and customs, practices, headnotes and rules of interpretation, and definitions incorporated to add clarity to the classification provisions.

VESSEL COLLISION LIABILITY: S. 2313 (Magnuson), introduced on July 26, a bill to unify apportionment of liability in cases of collision between vessels, and related casualties; to Committee on Commerce. Establishes provisions under which compensation for damages shall be settled after a collision between vessels, in whatever waters the collision takes place.

VESSEL TRANSFER: On July 19, Subcommittee on Fisheries and Wildlife Conservation of House Committee on Merchant Marine and Fisheries met on H. R. 3788, a bill to provide for the transfer of the United States vessel Alaska to the State of California for the use and benefit of the department of fish and game of such State. Testimony of a Congressman and various officials of the Interior Department were heard. Hearings were concluded. On July 27, the Subcommittee met in executive session and ordered reported to full committee H. R. 3788. On August 1, the House Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported H. R. 3788. On August 2, the Committee reported to the House H. R.

3788, without amendment (H. Rept. No. 837); referred to the Committee of the Whole House on the State of the Union.

VESSEL OWNERS'S LIABILITY: S. 2314 (Magnuson), introduced in Senate July 26, a bill to limit the liability of shipowners, and for other purposes; to Committee on Commerce. The owner of a vessel may limit his liability, and the liability of his vessel, with respect to claims arising from any of several occurrences, unless the occurrence giving rise to the claim resulted from actual fault or privity of the owner. Would include all seagoing vessels and all vessels used on lakes or rivers or in inland navigation, including pleasure yachts, tugs, towboats, towing vessels, tank vessels, fishing vessels, or their tenders, canal boats, scows, car floats, barges, lighters, and all nondescript self-propelled and non-self-propelled vessels.

WATER RESOURCES CONSERVATION: On July 26, the Senate Committees on Interior and Insular Affairs and Public Works held joint hearings on S. 2246 and S. 1629, providing financial assistance to the States for comprehensive water resources planning, receiving testimony from Secretaries of Interior, Agriculture, Labor, Health Education and Welfare, and the Assistant Secretary of the Army. Hearings were adjourned subject to call of the chair. The bill establishes a cabinet-level Water Resources Council to provide a comprehensive framework for water resources planning within river basins. It also permits the establishment of river basin water resources commissions to develop long-range schedules and plans, and provides federal financial assistance to the states for water resource planning.



CURED FISH WAS NORTH AMERICAN STOCK IN TRADE

"The early colonists in New England and the Maritime Provinces would not have been able to survive without the salt cod and smoked herring they could prepare, for soil was poor and the climate uncertain. While fish meant food to the early colonists, cured fish soon became their capital resource and their stock in trade for the purchase of supplies. Their most abundant fish, cod, could be manufactured into a durable protein food product, withstanding the primitive shipping and storage conditions of the day, and was comparatively low in price. Other cured fish such as smoked halibut and herring, pickled sturgeon, and salt salmon were soon being shipped abroad. Out of this grew the "triangular trade": salt fish to Europe, manufactured goods from Europe to the West Indies, and sugar, rum and molasses to New England. The trade in salt fish stimulated other industries and capital was gradually accumulated so that the colonists could go into shipping. Later, other natural resources such as timber were exploited, and the first attempts were made to create other local manufactures."

--Principles and Methods in the Canning of Fishery Products, Research Report No. 18 (page 2), U. S. Fish and Wildlife Service.

FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

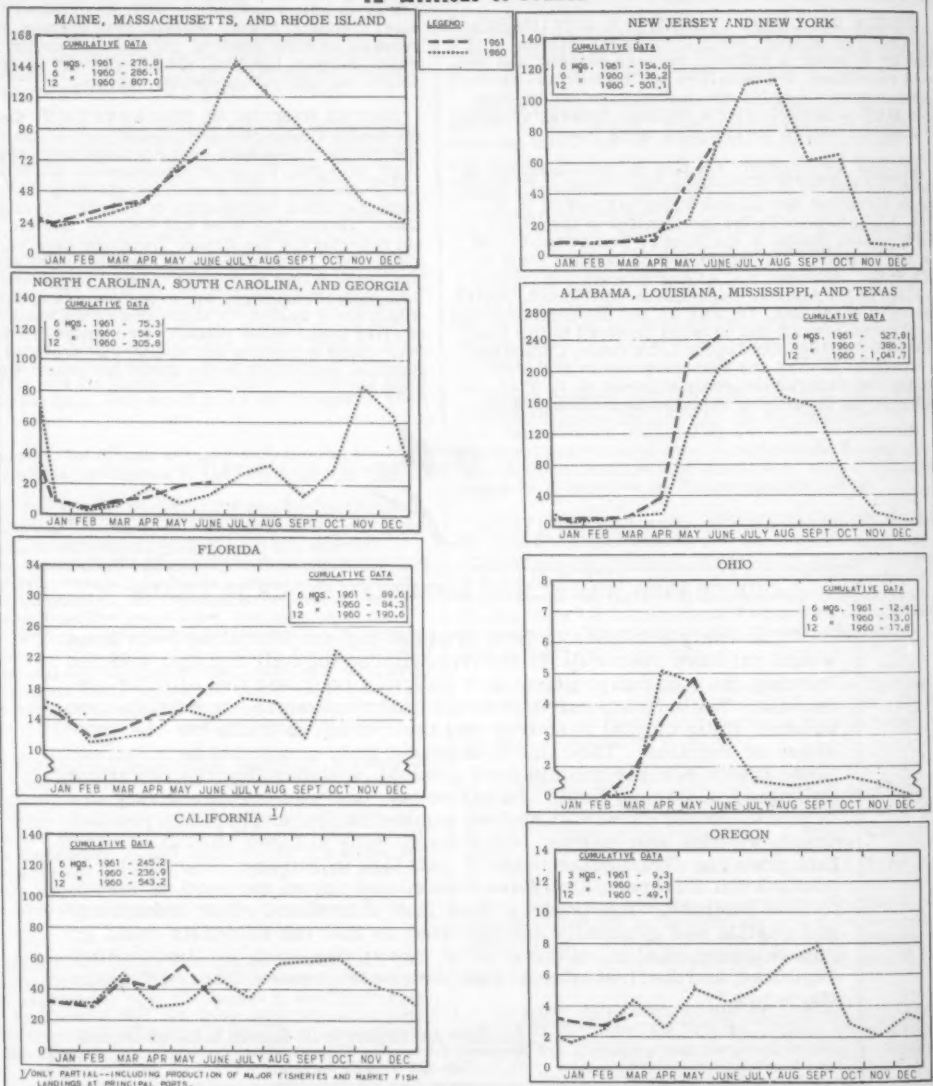
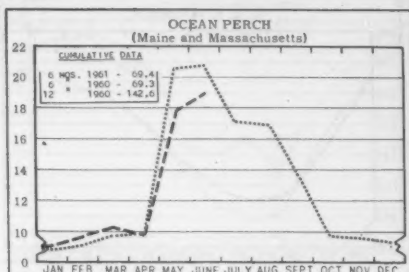
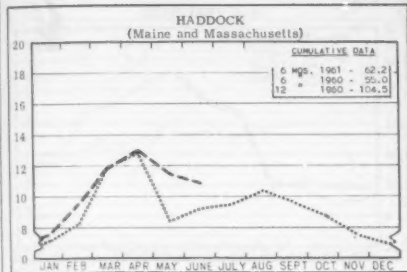
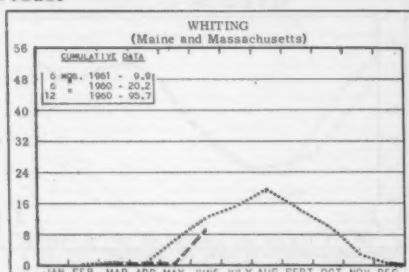
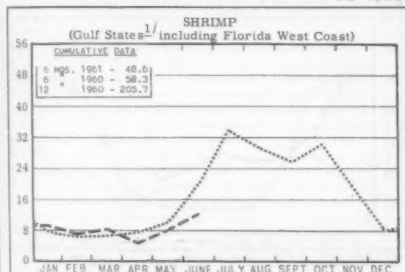


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

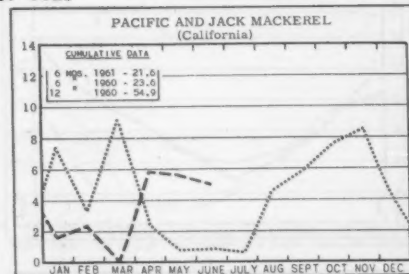
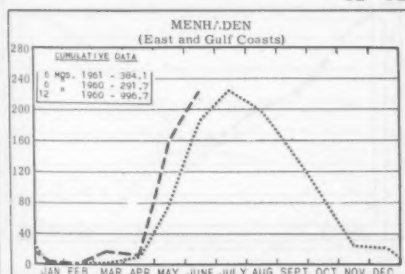


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

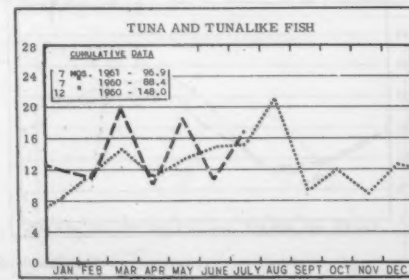
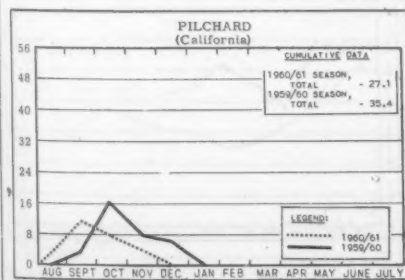


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds

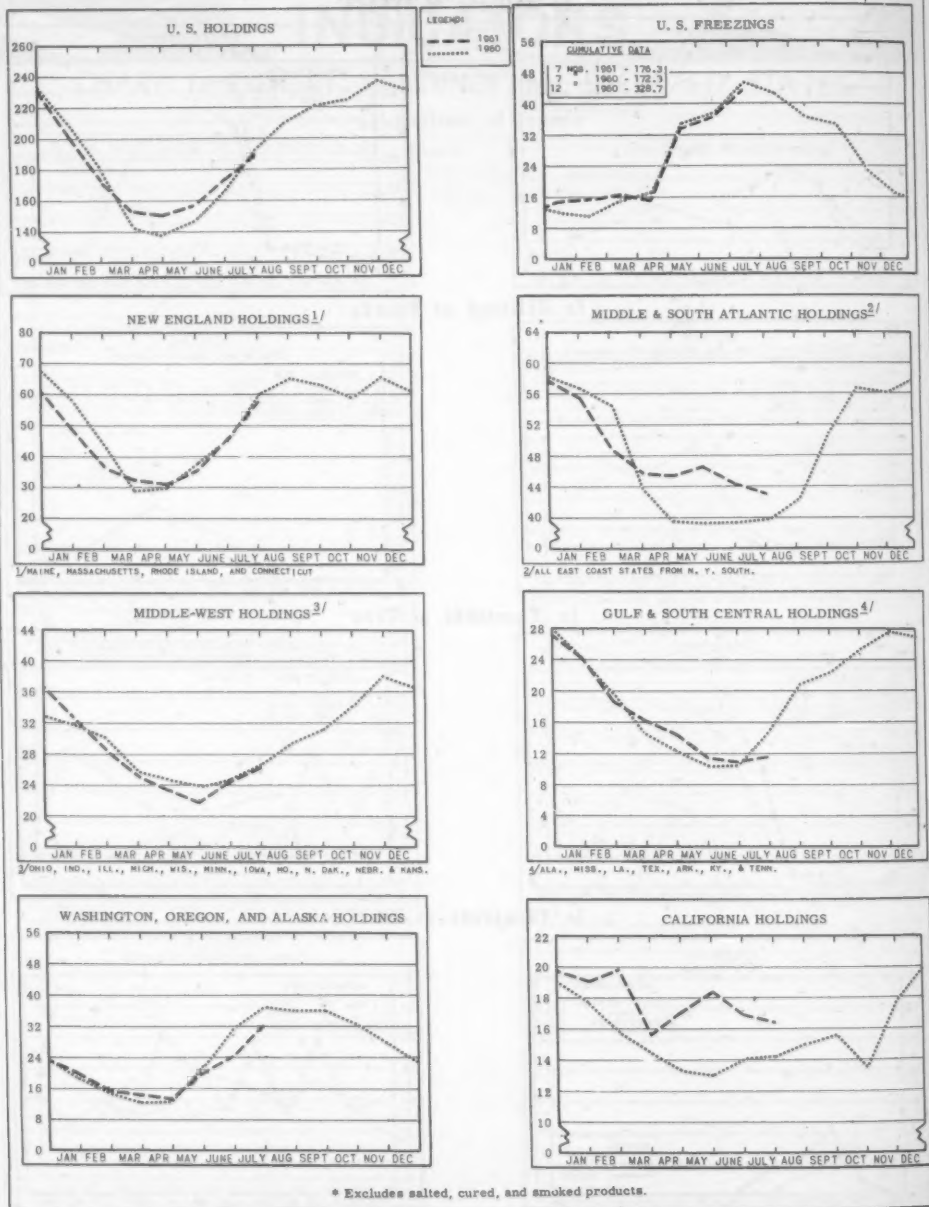
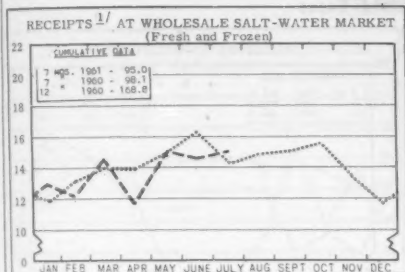


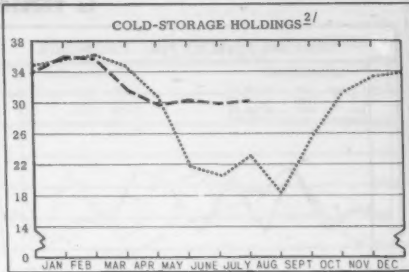
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

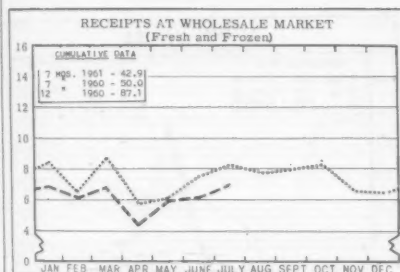


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY

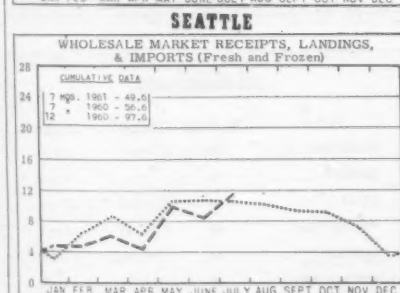
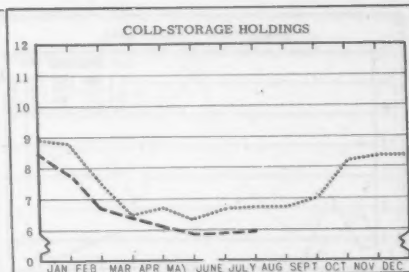
NEW YORK CITY



^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:
 --- 1961
 - - - 1960
 1950

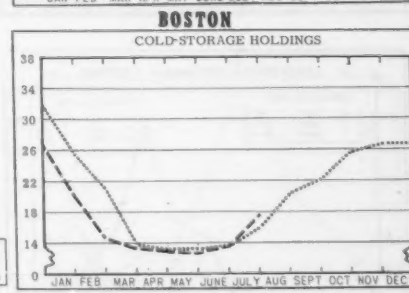


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

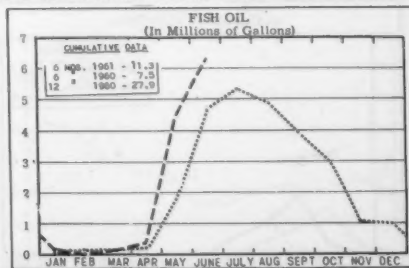
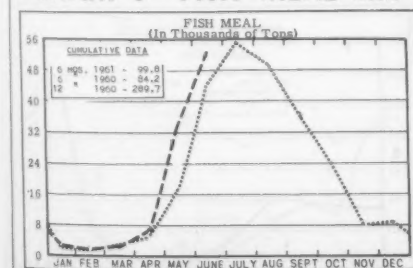
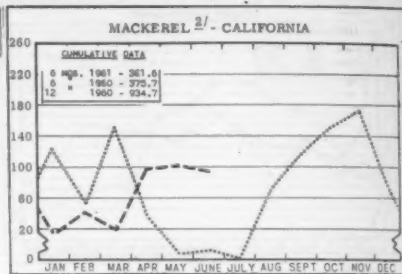
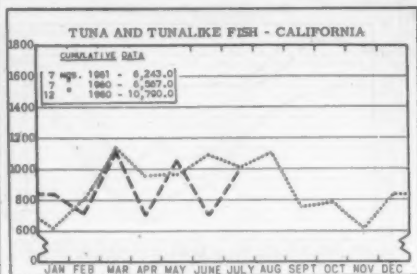
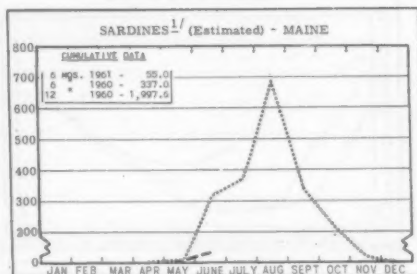
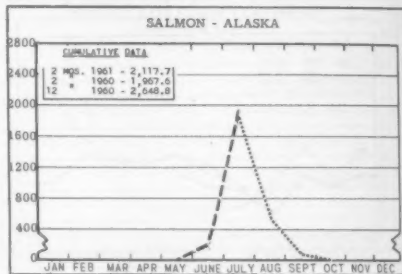
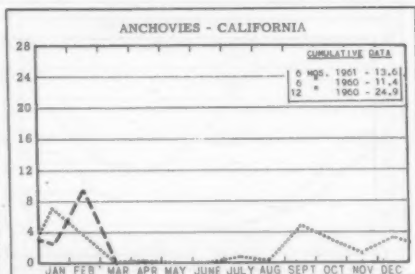


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



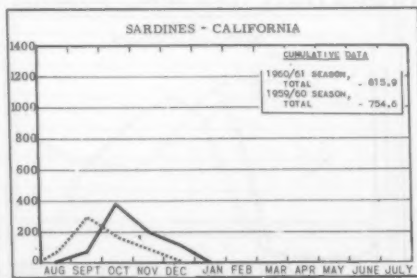
^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{4}$ drawn	3 $\frac{1}{2}$ os.
SHRIMP.....	48	--	5 os.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 os.
PILCHARDS...	48	# 1 oval	15 os.
SALMON.....	40	1-lb. tall	16 os.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 os.



LEGEND:
----- 1960/61
----- 1959/60

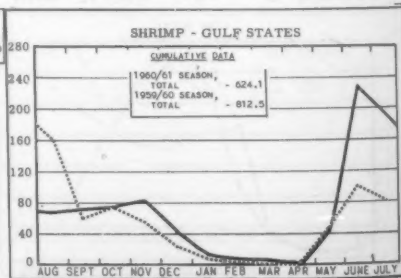
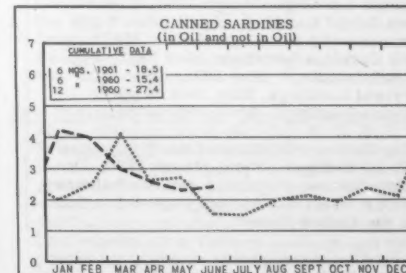
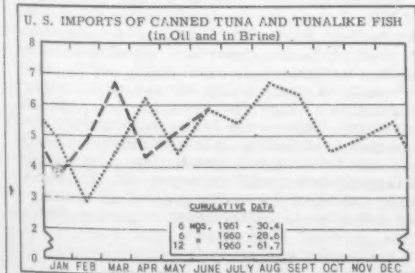
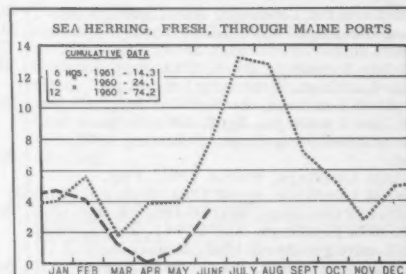
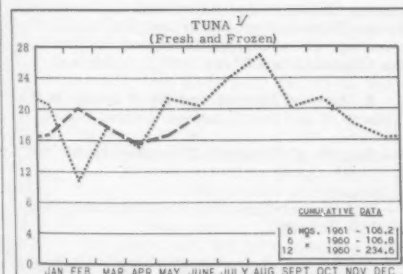
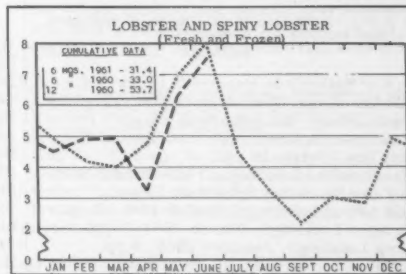
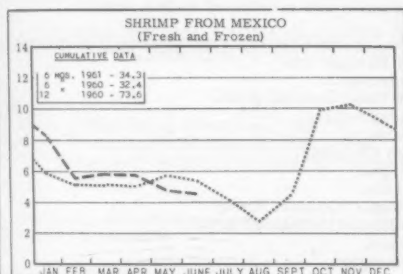
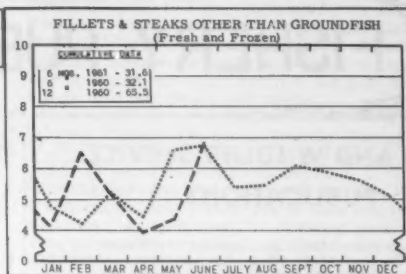
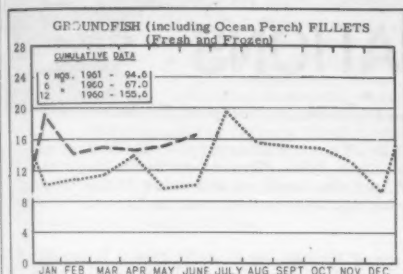
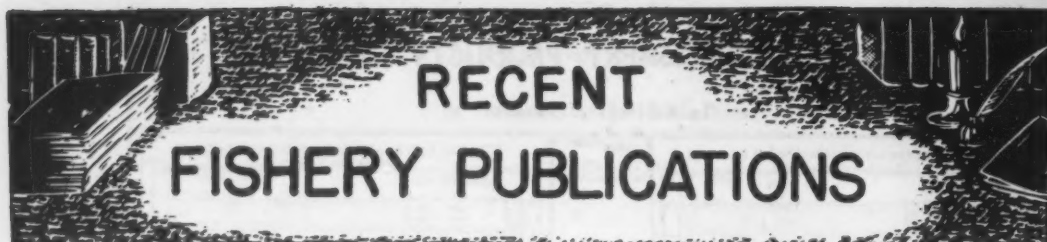


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|--|
| CFS-2589 | - Maine Landings, 1960 Annual Summary (by County, Gear, and Subarea), 17 pp. |
| CFS-2572 | - Massachusetts Landings, 1960 Annual Summary (by Ports), 16 pp. |
| CFS-2573 | - Massachusetts Landings, 1960 Annual Summary (by Gear and Subarea), 14 pp. |
| CFS-2591 | - Rhode Island Landings, March 1961, 3 pp. |
| CFS-2595 | - Wisconsin Landings, March 1961, 2 pp. |
| CFS-2598 | - Shrimp Landings, January 1961, 6 pp. |
| CFS-2599 | - Fish Meal and Oil, April 1961, 2 pp. |
| CFS-2604 | - Shrimp Landings, 1960 Annual Summary, 21 pp. |
| CFS-2607 | - South Carolina Landings, April 1961, 2 pp. |
| CFS-2609 | - Maine Landings, April 1961, 3 pp. |
| CFS-2610 | - Frozen Fish Report, May 1961, 8 pp. |
| CFS-2611 | - Michigan Landings, April 1961, 2 pp. |
| CFS-2613 | - Texas Landings, February 1961, 3 pp. |
| CFS-2614 | - Maryland Landings, April 1961, 3 pp. |
| CFS-2615 | - New York Landings, April 1961, 4 pp. |
| CFS-2616 | - Massachusetts Landings, February 1961, 5 pp. |
| CFS-2617 | - Virginia Landings, March 1961, 3 pp. |
| CFS-2618 | - Virginia Landings, April 1961, 3 pp. |
| CFS-2619 | - California Landings, March 1961, 4 pp. |
| CFS-2620 | - Minnesota Landings, April 1961, 2 pp. |
| CFS-2621 | - Ohio Landings, April 1961, 2 pp. |
| CFS-2622 | - Wisconsin Landings, April 1961, 2 pp. |
| CFS-2623 | - Mississippi Landings, April 1961, 2 pp. |
| CFS-2624 | - Alabama Landings, March 1961, 3 pp. |
| CFS-2625 | - Rhode Island Landings, April 1961, 3 pp. |
| CFS-2626 | - Massachusetts Landings, April 1961, 5 pp. |
| CFS-2627 | - North Carolina Landings, May 1961, 4 pp. |
| CFS-2629 | - Georgia Landings, May 1961, 2 pp. |
| CFS-2632 | - Maryland Landings, May 1961, 3 pp. |
| CFS-2638 | - Alabama Landings, April 1961, 3 pp. |

FL-508 - Whirling Disease (Myxosporidia: *Myxosoma*) of Trout, by G. L. Hoffman, 2 pp., March 1961. Describes whirling disease of trout, a serious hatchery disease in Europe which has recently spread to Russia, Italy, and the United States.

FL-511 - The Sea Urchin Fishery, by Leslie W. Scattergood, 4 pp., illus., 1961. Describes the biology of the sea urchin, and the landings and value of the catch of this little-known fishery, centered in Lincoln County, Me.

FL-513 - Rains of Fishes, by Lola T. Dees, 5 pp., April 1961. Reports of fishes falling with rain have been recorded in many parts of the world since early times. A few instances are mentioned in this leaflet.

Wholesale Dealers in Fishery Products, 1961 (Revised):

- SL- 2 - New Hampshire.
SL- 5 - Connecticut.
SL- 6 - New York Coastal Area.
SL- 8 - Pennsylvania.
SL- 9 - Delaware.
SL-14 - South Carolina.
SL-15 - Georgia.
SL-16 - Florida.
SL-17 - Alabama (Coastal Area).
SL-18 - Mississippi (Coastal Area).
SL-22 - Oregon.
SL-23 - Washington.
SL-39 - Tennessee (Mississippi River and Tributaries).
SL-40 - Oklahoma (Mississippi River and Tributaries).
SL-41 - Arkansas (Mississippi River and Tributaries).
SL-43 - Alabama (Mississippi River and Tributaries).
SL-45 - Mississippi (Mississippi River and Tributaries).
SL-46 - Texas (Mississippi River and Tributaries).

Sep. No. 624 - A Study of Vessel and Gear Usage in the Shrimp Fishery of the Southeastern United States.

Sep. No. 625 - Report of "Jellied" Flounder from Gulf of Mexico.

Sep. No. 626 - Equipment Note No. 9 - The Surf-Clam Fishery of New Jersey.

Annual Report, Biological Laboratory, Woods Hole, Massachusetts, for the Year Ending June 30, 1960, by Herbert W. Graham, Circular 99, 64 pp., illus., December 1960. Discusses the facilities and activities of the Woods Hole Biological Laboratory during fiscal year 1960. Includes reports of investigations on cod, flounder, haddock, hake, and ocean perch. Also includes results of sea scallop, aquarium and experimental, benthonic ecology, fish behavior, and plankton ecology studies. Covers the Laboratory's work in instrumentation--including underwater television observations and radiological monitoring; port sampling; fish tagging; and shellfish research. Studies relating to the management of the groundfish of the Northwest Atlantic, including mesh regulation inves-

tigations, continued to occupy an important place in the Laboratory program.

Annual Report of the Fish and Wildlife Service, Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, for the fiscal year 1960, 49 pp., illus., printed. (Reprinted from the Annual Report of the Secretary of the Interior, for the fiscal year ended June 30, 1960, pp. 319-367.) Summarizes the various activities of the Service. Describes the activities of the Bureau of Commercial Fisheries: biological research (shellfish, anadromous, inland, and marine fisheries); industrial research; resource development services; Pribilof Islands fur-seal harvest; and Columbia River fishery development program. Bureau of Sport Fisheries and Wildlife activities discussed include, among other projects, Federal aid to the states for the restoration of fish and wildlife; fish hatcheries; fishery management services; and river basin studies.

Wildlife Research Progress in the Fiscal Year 1960, by Daniel L. Leedy, Circular 104, 33 pp., illus., January 1961.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-53	- Fisheries of Honduras, 1961.
MNL-54	- Fisheries in British Borneo, 1960.
MNL-55	- Brazilian Shrimp Processing Companies, 1961.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary - Fishery Products, April 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 So. Gay St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the month indicated.

California Fisheries, 1960, by V. J. Samson, 42 pp., illus. (Market News Service, U. S. Fish and Wildlife Service, Rm. 208, Post Office Bldg., San Pedro, Calif.) A review of 1960 trends and conditions in the California fisheries, including a historical review of California fish meal prices, 1930-60. Among the subjects discussed are the tuna industry and cannery receipts; domestic tuna fishery--economic recovery effected by conversion of clippers to purse seiners; albacore fishery--including ex-vessel prices; other tuna prices; canned pack; and imports. Also discussed are the sardine industry and canned pack; mackerel fishery, pack, and prices; anchovy fishery; canned pet food pack; whaling industry; and seasons in major fisheries. Included in the statistical tables are data on tuna and tunalike fish--cannery receipts, domestic landings, cannery receipts of frozen imported tuna, and canned pack, 1958-60; sardine landings, canned pack, and meal and oil produced, 1960 and 1959 seasons; and the cannery receipts and pack of mackerel and jack mackerel, 1958-60. Also included are data on cannery receipts of raw materials and production of anchovies, herring, squid, pet food, and meal and oil; freezings and cold-storage

holdings of fish and shellfish; landings in the Eureka and San Pedro-Santa Monica areas; and imports of fishery products into Arizona and California Customs Districts, 1959-60.

California Fishery Products and Byproducts Brokers and Importers, 1961 (Partial List, Revised April 15, 1961), SP List 1, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) Contains the names and addresses of primary receivers of various types of imported fishery products and byproducts in the Los Angeles, San Diego, and San Francisco areas.

California Fishery Products Monthly Summary, Part I - Fishery Products Production and Market Data, May 1961, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts of fresh and frozen tuna and tunalike fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, June 1961, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, May 1961, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; fishery imports at Port Isabel and Brownsville, Tex., from Mexico; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, June 1961, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, Chincoteague, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, May 1961, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester,

ter, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; Atlantic Ave., Boston, Mass., landings and ex-vessel prices; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New England Importers and Brokers of Imported Fishery Products, 1961, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Contains the names and addresses of primary receivers of various types of imported fishery products and byproducts in Boston, Mass., and vicinity; other Massachusetts areas; Connecticut; Maine; and Rhode Island.

New York City's Wholesale Fishery Trade--Monthly Summary for May 1961, 24 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market; imports entered at New York City; primary wholesaler prices for fresh, canned, and frozen products; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

New York City's Wholesale Fishery Trade, 1960 (Includes Statistics and Marketing Trends), by T. J. Risoli, 58 pp. (Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York 38, N. Y.) The first part of this annual summary discusses fishery products receipts and marketing trends in the salt-water section of New York's wholesale Fulton Fish Market during 1960. The second part covers marketing trends and receipts in the wholesale fresh-water fish market for 1960. The third part consists of a series of statistical tables giving monthly overland and vessel receipts; receipts by species, methods of transportation, states, and provinces, 1960; and imports of fishery products at New York City, 1960.

Seattle, Washington, Brokers and Importers of Fishery Products, 1960, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42, So., Seattle 4, Wash.) Contains the names and addresses of primary receivers of various types of imported fishery products and byproducts and the country of origin.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

"Additional Notes on the Maintenance of Immature Sea Herring in Captivity," by H. C. Boyar and C. J. Sindermann, article, Progressive Fish-Culturist, vol. 21, no. 4, 1959, pp. 185-187, processed, 25 cents a copy.

"Rapid Measurement of Fish," by Leonard L. Joeris, article, Progressive Fish-Culturist, vol. 21, no. 4, 1959, pp. 190-191, processed, 25 cents a copy.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ANCHOVIES:

Estudio Preliminar sobre la Biometria, Biologia y Variación del Contenido Graso del Boqueron, ENGRAULIS ENCRASICHOLUS L., de Malaga (Preliminary Study on the Biometrics, Biology, and Variation in Oil Content of the Anchovy, *Engraulis encrasicolus* L., at Malaga), by R. F. Crehuet and M. J. del V. Cordon, Boletín del Instituto Espanol de Oceanografía, no. 99, June 1960, 28 pp., illus., printed in Spanish. Instituto Espanol de Oceanografía, Alcala, 27, Madrid, Spain.

ANTIBIOTICS:

"In Vitro Effects of Chlortetracycline on Bacteria Indigenous to Gulf Shrimp and Oysters," by Arthur F. Novak, Ernest A. Fieger, and Keith A. Stolzle, article, Food Technology, vol. 14, November 1960, pp. 585-586, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

ANTIOXIDANTS:

Hydrolysis of Fish Materials, by Robert H. Bedford, U. S. Patent No. 2,806,790, September 17, 1957, printed. U. S. Patent Office, Washington 25, D. C.

"Improvement of the Keeping Quality of Fresh Fish by Treatment with Antioxidants," by A. Liljemark, H. W. Aas, and R. Marcuse, article, Fette Seifen Anstrichmittel, vol. 61, 1959, pp. 465-468, printed in German. Fette Seifen Anstrichmittel, Industrie-Verlag von Herhausen K. G., 24 Rodingsmarkt, Hamburg 11, Germany.

"Refractive Index of Crystalline Guanine from Marine Fish," by Tadashi Ueda, and Jogoro Matsuzawa, article, Norinsho Suisan Koshusho Kenkyu-Hokoku, vol. 6, 1956, pp. 97-100, printed in Japanese. Norinsho Suisan Koshusho Kenkyu-Hokoku, Ministry of Agriculture and Forestry, Marine Products Training Center, Shimonoseki, Japan.

"Utilization of Fish Liver Residues," by C. Gunasekera, article, Indo-Pacific Fisheries Council Proceedings, vol. 8, no. 2, 1960, pp. 89-92. Indo-Pacific Fisheries Council Secretariat, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Bangkok, Thailand.

ARGENTINA:

Camara Marplatense de Industrias del Pescado - Memoria y Balance, Periodo 1959-1960 (Association of Mar del Plata Fish Processors - Report and Financial Statement, 1959-1960), 140 Ejercicio, 19 pp., printed in Spanish. Camara Marplatense de Industrias del Pescado, Calle 11 de Septiembre No. 2843, Mar del Plata, Argentina.

BALEARIC ISLANDS:

Carta de Pesca de las Baleares. II--Norte de Mallorca y Menorca y Este de Mallorca (Chart of the Balearic Islands' Fishery. II--North of Majorca and Minorca and East of Majorca), by Miguel Oliver, no. 29, illus., printed in Spanish. Instituto Espanol de Oceanografía, Alcala, 27, Madrid, Spain, 1960.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

BIOCHEMISTRY:

"Amino Acid Composition of the Muscle Extracts of Aquatic Animals," by K. Ito, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 23, nos. 7 and 8, 1957, pp. 497-500, printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, Tokyo University of Fisheries, Shiba-Kai-gandori 6-chome, Minato-ku, Tokyo, Japan.

"The Separation and Determination of Sugar Phosphates, with Particular References to Extracts of Fish Tissue," by N. R. Jones and J. R. Burt, article, *Analyst*, vol. 85, November 1960, pp. 810-814, printed. Analyst, W. Heffer and Sons, Ltd., 3/4 Petty Curry, Cambridge, England.

"Studies on the 'Kamaboko', Fish Jelly, and Fish Sausage Products. VII--Influence of Added Salt Upon the Water Intake of Fish Flesh (Parts 1 and 2)," by Kazuhiro Okamura, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, January 1960, pp. 60-74, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

BRAZIL:

Pesca, 1959, *Estrutura e Producao* (Fisheries, 1959, Industry Data and Production), 42 pp., processed in Portuguese. Ministerio da Agricultura, Servico de Estatistica da Producao, Rio de Janeiro, Brazil, March 1961.

CALIFORNIA:

A Preliminary Report on the Fishery Resources of California in Relation to the Central Valley Project, by Willis H. Rich and others, 22 pp., processed. Stanford University, Calif., August 19, 1944.

CANADA:

Journal of the Fisheries Research Board of Canada, vol. 18, no. 2, March 1961, 148 pp., illus., printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, the following articles: "Artificial Drying of Cambodian Fish," by R. Legendre; "Probable Effects of Proposed Passamaquoddy Power Project on Oceanographic Conditions," by R. W. Trites; "Herring Movements in the Bay of Fundy and Gulf of Maine, 1957 and 1958," by R. A. McKenzie and S. N. Tibbo; "Correlation of Morphological and Intra-Ocular Measurements in the Atlantic Salmon (*Salmo salar*) Yearling," by M. A. Ali, P. Copes, and W. R. Stevenson; "Occurrence of Two Species of Juvenile Rockfish in Queen Charlotte Sound," by C. R. Hitz; "Abnormalities in Lake Erie Whitefish," by G. H. Lawler; and "Biosynthesis of Trimethylammonium Compounds in Aquatic Animals. II--Role of Betaine in the Formation of Trimethylamine Oxide by Lobster (*Homarus americanus*)," by E. Bilinski.

Sport Fish Resources of British Columbia. Part IV--A General Evaluation, by Roderick L. Haig-Brown, 10 pp., processed. British Columbia Game Commission, 587 Burrard St., Vancouver, B. C. Canada, 1956.

CANNING:

Maquina para Coccion del Pescado Dentro de su Envase--Primera Instalada en Espana (Machine for Processing Fish in the Container--First Installation

in Spain), by Braulio Alfageme de Riva, 4 pp., illus., printed in Spanish. (Reprinted from *IDE--Informacion de Embalaje*, no. 18.) Instituto Espanol del Envase y Embalaje, Breton de los Herreros, 67, Madrid (3), Spain.

CARP:

"Influence of Motor Agitation on the Amount of Corticosteroids in the Plasma of a Teleost: The Carp (*Cyprinus carpio*)," by Jeanine Leloup-Hatey, article, *Journal de Physiologie* (Paris), vol. 52, 1960, pp. 145-146, printed. *Journal de Physiologie*, Librairie Masson et Cie, 120 Blvd. St. Germain, Paris 6^e, France.

"Myogens of the Carp and Plaice," by J. G. Henrotte, article, *Biochimica et Biophysica acta*, vol. 39, 1960, pp. 103-121, printed in French. *Biochimica et Biophysica Acta*, Elsevier Publishing Co., 215 4th Ave., New York 3, N. Y.

Spawning and Development of Common Carp (CYPRINUS CARPIO) in Egyptian Ponds, by A. E. Imam and M. T. Hashem, Notes and Memoirs No. 54, 14 pp., illus., printed in English and Arabic. Ministry of Agriculture, Hydrobiological Department, Serow Fish-Farm, Gammalia, Dakahlia, Egypt, 1960.

CHLORTETRACYCLINE:

"The Determination of Chlortetracycline in Tissues. Parts I and II," by Tetuo Tomiyama, Atsushi Tsuda, and Yasuo Yone, article, *Food Research*, vol. 25, January-February 1960, pp. 97-112, printed. Food Research, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

"Stability and Bacteriostatic Effect of Chlortetracycline in Sea Water," by Yasuo Yone, Seiya Fuzino, and Tetuo Tomiyama, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, May 1960, pp. 514-519, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

CHOLESTEROL:

"The Effect of Marine Products on the Blood Cholesterol Levels in Man and in Animals. A Review," by J. D. Wood, article, *Journal of the Fisheries Research Board of Canada*, vol. 17, December 1960, pp. 903-912, printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer and Controller of Stationery, Ottawa, Canada.

COD:

"The Acid-Soluble Nucleotides of Codling (*Gadus callaria*) Muscle," by N. R. Jones and J. Murray, article, *Biochemical Journal*, vol. 77, December 1960, pp. 567-574, printed. *Biochemical Journal*, Cambridge, University Press, 200 Euston Rd., London NW1, England.

"Studies on the North Sea Cod. III--Effects of Starvation," by R. M. Love, article, *Journal of the Science of Food and Agriculture*, no. 9, September 1958, pp. 617-620, printed. *Journal of the Science of Food and Agriculture*, Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

COMPOSITION:

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THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

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"Marine Sterols. VII--The Synthesis of 29-Isocuosterol and the Attempted Synthesis of 17-Dehydrocholesterol," by U. H. M. Fagerlund and D. R. Idler, article, *Journal of the Fisheries Research Board of Canada*, vol. 17, July 1960, pp. 597-599, printed. *Journal of the Fisheries Research Board of Canada*, Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Sulfhydryl Groups of Tuna Myoglobins and Hemoglobins, Whale Hemoglobin, Tobacco Mosaic Virus, and Ovalbumin," by W. Duane Brown, Marino Martinez, and Harold S. Olcott, article, *Journal of Biological Chemistry*, vol. 236, January 1961, pp. 92-95, printed. *Journal of Biological Chemistry*, American Society of Biological Chemists, 428 East Preston St., Baltimore 2, Md.

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Seafood Cookery in North Carolina, compiled by Frank B. Thomas, 48 pp., illus., printed, 25 cents. Public Information Office, North Carolina Department of Conservation and Development, Raleigh, N. C., September 1960. Outlines the forms in which fish are marketed and contains instructions for preparing finfish, shrimp, oysters, clams, crabs, and scallops. Also included are recipes for sauces, canapes, and hors d'oeuvres, soups and chowders, and stuffings made or to be served with fish.

CUTTLEFISH:

"Biochemical Studies on the Viscera of Cuttlefish *Ommastrephes sloani pacificus*. III--On the Proteolytic Enzymes of Viscera (Part I)," by Takashi Takahashi, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, May 1960, pp. 500-503, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

DENMARK:

Fisheries Ministry's Research Laboratory Annual Report for 1959, 51 pp., printed in Danish and English. Fisheries Ministry's Research Laboratory, Copenhagen, Denmark, 1960.

"Main Experimental Results," article, *Fiskeriministeriets Forsøgslaboratorium for 1959* (Annual Report to the Danish Fishing Industry), pp. 41-49, printed in Danish and English. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, 1960.

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Dietary Fat and Its Relation to Heart Attacks and Strokes (Report of the Ad Hoc Committee on Dietary Fat and Atherosclerosis), 4 pp., printed. *Dietary Fat and Its Relation to Heart Attacks and Strokes* (Report by the Central Committee for Medical and Community Program), 5 pp., printed. (Reprints of the same article in *Circulation*, vol. 23, January 1961--the second reprint also contains a list of questions and answers based on the report and designed to interpret the meaning and application of the report for the general public). American Heart Association, 44 E.

23rd St., New York 10, N. Y. Reduced fat consumption, combined with reasonable substitution of vegetable oils and other unsaturated fats for animal fats in the diet, is recommended in this report as a possible means of preventing atherosclerosis (hardening of the arteries) and lessening the risk of heart attacks and strokes. Recommendations are based on the best scientific information available at the present time. However, there is no final proof that dietary changes can prevent heart attacks and strokes. The Committee preparing the report states that, "Not all fats in the diet have the same effect on the amount of cholesterol in the blood. In the usual diet eaten in the United States, a large part of the fat is of the saturated type... which tends to increase the cholesterol in the blood. In contrast... many natural vegetable oils, such as corn, cotton seed, and soya, as well as the fat of fish, are relatively low in saturated fats and high in fats of the poly-unsaturated type. When these fats are substituted for a substantial part of the saturated fats without increasing calories, blood cholesterol decreases." In conclusion, the Committee called for intensified research into the causes and prevention of atherosclerosis. "This is essential to obtain more complete information on which more definite recommendations can eventually be based."

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ECOLOGY:

Ecology of Inland Waters and Estuaries, by George K. Reid, 375 pp., printed, \$7.50. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.

Experimental Ecology of the Feeding of Fishes, by V. S. Ivlev, 302 pp., printed, translated from Russian, \$7.50. Yale University Press, 143 Elm St., New Haven, Conn., 1961. Summary of the results of investigations undertaken to establish experimentally the fundamental laws of the trophic ecology of fish, of selective feeding, indirect food relations of fish, and ecology of starvation.

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PARACONGER, a New Genus with Three New Species of Eels (Family Congridae), by Robert H. Kanazawa, 14 pp., illus., printed. (Reprinted from *Proceedings of the United States National Museum*, vol. 113, no. 3450, 1961, pp. 1-14.) Smithsonian Institution, Washington, D. C.

EGYPT:

The Fishery Grounds Near Alexandria. XIX--Mollusca, by Adolf Steuer, Notes and Memoirs No. 33, 151 pp., illus., printed. Ministry of Commerce & Industry, Fouad Institute of Hydrobiology and Fisheries, Alexandria, Egypt, 1939.

ELECTRIC FISHING:

"Electronic Fishing With Underwater Pulses," by Harry P. Dale, article, *Electronics*, vol. 32, no. 4, 1959, printed. Electronics, McGraw-Hill Book Co., 330 W. 42nd Street, New York 36, N. Y.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

An Investigation into the Effects of Electric Fishing Equipment on Salmon and Sea Trout within the Area of the Lancashire River Board, by L. Stewart, 21 pp., illus., printed. Lancashire River Board, 18a Great John St., Lancaster, England.

ELECTRONIC FISHING:

"Fish Fight Losing Battle Against Science," article, *Chemical and Engineering News*, vol. 38, September 19, 1960, p. 140, printed. Chemical and Engineering News, The American Chemical Society, 1801 K. St. NW, Washington 6, D. C. Discusses the use of the new "electronic fishing line." The line, actually a steel cable, carries electrical conductors so that fishermen might attach to the line various electrical and electronic devices. A depth telemeter, for instance, would be attached to the cable to show the depth of the net. The crew would then raise or lower the net to snare a catch previously spotted by echosounding. Another aid to the fisherman would be an on-bottom indicator which would tell the fishermen when the net rose off the ocean bottom. A third device, a ground indicator similar to a speedometer, would be attached to the cable to help the crew determine the progress of the trawl along the sea bottom. Still other instruments would indicate the water temperature and the size of the catch. One of the most important uses of the cable would be for attaching lights. These lights, shining deep below the surface, would attract fish into the path of the trawl.

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FAROE ISLANDS:

"The Fishery of the Faroes 1952-1960," article, *Faroes in Figures*, no. 14, June 1961, pp. 2-6, printed. Faero Amt's Sparekasse, Thorshavn, Faroe Islands.

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"Comparative Analytical Studies of Fatty Acids of the Alga *Chlorella pyrenoidosa*," by Hermann Schlenk and others, article, *Journal of the American Oil Chemists' Society*, vol. 37, November 1960, pp. 547-552, printed. American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

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"O Reaktsii Ryby na Zvuk i Shumovykh Spektrakh Traulera" (On Fish Reaction to Sound and to Noise Spectra of a Trawler), by E. V. Shishkova, article, *Rybnoe Khoziaistvo*, no. 3, March 1958, pp. 33-39, printed in Russian. *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FISH CULTURE:

Fish-Culture in Egyptian Rice Fields, by A. H. Shaheen, A. E. Imam, and M. T. Hashem, Notes and Memoirs

No. 55, 20 pp., printed in English with Arabic abstract. Ministry of Agriculture, Hydrobiological Department, Serow Fish-Farm, Gammalia, Dakahlia, Egypt, November 1959. Discusses the preparation, advantages, and difficulties of fish culture in rice fields. Tables cover results of experiments using tilapia, carp, and mixed cultures in rice fields.

"Oznachenii Vneshnikh Priznakov Pishchi pri Kormlenii Molodi Lososia i Foreli" (On the Importance of External Signs of Food in Feeding Salmon and Trout Young), by Iu. A. Labas, article, *Rybnoe Khoziaistvo*, no. 6, June 1959, pp. 32-37, printed in Russian. *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FISH MEAL:

"The Nutritive Value of Fish Meal Protein: A Comparison of Chemical Measurements with a Chick-Feeding Test," by Claude E. Thurston, L. E. Ousterhout, and Patricia P. MacMaster, article, *Journal of the Association of Official Agricultural Chemists*, vol. 43, November 1960, pp. 760-762, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

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"One-Man" Measuring Board, by T. Williams, Indo-Pacific Fisheries Council Occasional Paper 60/3, 4 pp., illus., printed. Indo-Pacific Fisheries Council Secretariat, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Bangkok, Thailand, 1960.

FISH MOUNTING:

"Plaster Casts of Fish," by Dwight A. Webster, article, *The Conservationist*, April-May 1961, pp. 28-32, illus., printed. The Conservationist, Rm. 335, State Campus, Albany, N. Y.

FISH OIL:

"Chemical Properties of Oils in Gamma-Radiated Fish Meat and Products. Part II--Difference of Properties of the Oil by Various Packing Films," by Takashi Kaneda, Seinosuke Ishi, and Hisae Sakai, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, August 1960, pp. 823-826, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kai-gandori, Minato-ku, Tokyo, Japan.

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FISH PROCESSING:

Selected Articles from Technology of Fish Processing, edited by T. I. Makarova, OTS 60-21865, 268 pp., illus., printed, \$2.75. Order by OTS number. Available from the Office of Technical Services, U. S. De-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

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"Aerobic and Anaerobic Growth of Three Kinds of *Bacillus* Which are Isolated from Fish Sausage," article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 25, November 1959, pp. 554-560, printed in Japanese, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

"Bacteriological Studies on the Spoilage of Fish Sausages. IV--The Formation of Volatile Acid and Volatile Base by *Bacillus*" and "V--The Formation of Volatile Acid in the Course of the Spoilage of Fish Sausage," by Mikio Akamatsu, articles, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, June 1960, pp. 581-594, printed in Japanese with English abstract, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

FISH SCALES:

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"Chemical Indices of Decomposition in Flounder," by Fred Hillig and others, article, *Journal of the Association of Official Agricultural Chemists*, vol. 43, November 1960, pp. 755-760, printed, Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

"Polia Pitaniia Kamball (*Pleuronectidae*) v Kronotskom Zaliv" (Feeding Grounds of Flounder in the Kronotsk Gulf), by A. P. Kuznetsov, article, *Rybnoe Khoziaistvo*, no. 1, January 1958, pp. 7-11, printed in Russian, *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FOOD AND AGRICULTURE ORGANIZATION:

Catalogue of Fisheries Publications and Documents, compiled by Patricia M. Andrews, 29 pp., processed, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 1961. Lists periodicals, FAO Fisheries Studies, FAO Fisheries Papers, separate publications, and publications of the General Fisheries Council for the Mediterranean. Also lists publications of the Indo-Pacific Fisheries Council, reports of the Latin American Fisheries Training Centers, reports of the Expanded Technical Assistance Program, and reprints of articles appearing in *FAO Fisheries Bulletin* and other periodicals.

Experience in Fishing Boat Building Applicable to the Indo-Pacific Region (Indo-Pacific Fisheries Council, 9th Session), by J. O. Traung, 26 pp., illus., printed, Indo-Pacific Fisheries Council Secretariat, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Bangkok, Thailand, January 1961.

FOOD PROCESSING:

An Introduction to Thermal Processing of Foods, by S. A. Goldblith, M. A. Joslyn, and J. T. R. Nickerson, 1140 pp., illus., printed, domestic \$16.50, foreign \$17.50. The AVI Publishing Co., Inc., P. O. Box 388, Westport, Conn., 1961. This volume, the first of several proposed in a series, presents some of the important original papers relating to the microbiology and thermal processing of foods--examples of the food science literature of 1809 to 1960. In all instances, the papers are reproduced as originally published with the exception of the foreign papers of which translations are presented. The section on microbiology reprints in its original format the K. G. Bittling translation of the classic, Appert's *The Art of Preserving Animal and Vegetable Substances for Many Years* (original published in 1810), and many early articles on food technology. The section on heat transfer includes articles on temperature-time relations, heat penetration, and similar topics. The part devoted to process calculation presents findings on thermal processing in tin containers, the use of bacteriological techniques in quality control, and related studies. The concluding section on adaptation to commercial conditions, contains articles on agitating in processing and the use of the flash process and aseptic fill. Liberally illustrated with diagrams, photographs, and tables, this textbook should be invaluable to food industry people and any student of foods and food science. It contains some references to fishery products processing. Reprinted in the book are the works of Prescott and Underwood of Massachusetts, and Russell of Wisconsin. Also, papers are presented illustrating the first use of the thermocouple; Howard's original publication on mold count; Breed's original paper on the direct microscopic count; etc.

FREEZE-DRYING:

"Freeze-Drying," by John V. Ziemba, article, *Food Engineering*, vol. 32, December 1960, pp. 57-64, printed, Food Engineering, McGraw-Hill Publishing Co., 330 West 42nd St., New York 36, N. Y.

FREEZING:

"Congelacion del Pescado por Contacto" (Contact-Freezing Fish), by J. M. Casa Lopez-Valeiras, articles, *Metalurgia y Electricidad*, vol. 23, no. 267, December 1959, pp. 151-157; and vol. 24, no. 268, January 1960, pp. 279-287, illus., printed in Spanish, *Metalurgia y Electricidad*, #7 Cuesta de Santo Domingo, Madrid, Spain.

FROZEN FISH:

"Rapid Fish Thawing Method Developed by Torry," article, *Food Manufacture*, vol. 35, August 1960, p. 352, printed, Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

FROZEN FOODS:

A Bacteriological Survey of the Frozen Precooked Food Industry, by L. R. Shelton, Jr., and others,

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32 pp., processed. U. S. Department of Health, Education, and Welfare, Food and Drug Administration, Washington 25, D. C. Covers a survey conducted in March 1958-June 1959 of the frozen precooked foods industry to determine the need for and feasibility of establishing bacterial limits or standards for certain products. It deals with the relationship between plant operation and microbial content of the finished product. Foods are categorized in four major groups. Fish and shellfish products appear in three of the four groups. Bacteriological findings on all the finished products samples are summarized in tables. The fishery products specifically listed are: shrimp-burger, crabburger, macaroni and tuna, shrimp chow mein, shrimp rolls, lobster rolls, fried halibut, fried shrimp, haddock in wine sauce, lobster newberg, fried clams, fish sticks, fish cakes, crab cakes, deviled crab, stuffed crab, cream of shrimp soup, oyster stew, tuna pie, lobster pie, and raw breaded shrimp.

"A Visual Indicator of the Temperature of Frozen Food," by D. L. Nicol, article, *Chemistry and Industry*, no. 41, October 8, 1960, pp. 1261-1262, printed. Chemistry and Industry, Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

FUR SEAL:

Review of Fur Seal Operations and Administration of the Pribilof Islands, Bureau of Commercial Fisheries, United States Fish and Wildlife Service, Department of the Interior (Report to the Congress of the United States), 40 pp., processed. Comptroller General of the United States, Washington 25, D. C., June 1961.

GENERAL:

The Picture Book of Fisheries, by Anita Brooks, 96 pp., illus., printed, \$3.50. The John Day Company, Inc., 210 Madison Ave., New York 16, N. Y., 1961. A small book of good quality black and white photographs depicting man's worldwide struggle to wrest food from the oceans and waters of the earth. The author herself expresses the purpose of the book very well: "Along with information about some of the aspects of commercial fishing which I hope will be of use to young students, I have tried in this book to give a sense of the world through a collection of photographs--a world at work and at peace." In the introduction to the book, Dr. Hernane Tavares de Sa, U. N. Under-Secretary for Public Information, points out that the huge fishing industry that goes on night and day, all the year-round in good and bad weather, "is a good example of the relationship of many different countries and peoples to each other." Fishermen's work is the oldest in the world and today fish is still one of the world's most important necessary foods. For many countries, fish is the principal source of protein. Using pictures with clear, concise but descriptive captions, the author presents fishing as it is carried on in the seas, lakes, and streams of the world; the villages where fishermen live; how the catch is prepared and brought to market. A list of the most common varieties of fish as well as an index round out the book. Part of the "Picture Aids to World Geography" series, this book is excellent for introducing children to the romance of fishing. But it is an excellent addition to the library of any one interested in fisheries.

--J. Pileggi

Under Water and Sea Adventures: The Story of the Wonderful Waters Around the Earth, by Patrick Ellam, 92 pp., illus., printed, \$1.95. Grosset and Dunlap, Inc., 1107 Broadway, New York 10, N. Y., 1961. Tells young people about sea and winds, ocean bottom, marine animals, and bathyscaphs.

HERRING:

"Seasonal Variation in the Collagen Content of Pacific Herring Tissues," by J. R. McBride, R. A. MacLeod, and D. R. Idler, article, *Journal of the Fisheries Research Board of Canada*, vol. 17, December 1960, pp. 913-916, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Sildeinnisiget 1961" (Herring Fishery Outlook, 1961), by Finn Devold, article, *Fiskets Gang*, vol. 47, no. 18, May 4, 1961, pp. 366-368, illus., printed. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

"Sildeundersokelser i Norskehavet med F/F G.O. Sars, 5-17 Desember 1960" (Herring Research in the Norwegian Sea by G.O. Sars, December 5-17, 1960), by Ole J. Ostvedt, article, *Fiskets Gang*, vol. 47, no. 18, May 4, 1961, pp. 364-365, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

"Untersuchungen über die Verbreitung der Heringslarven im Englischen Kanal und der Sudlichen Nordsee im Januar 1959" (Investigation of the Dissemination of Herring Larvae in the English Channel and in the Southern Part of the North Sea in January 1959), by Gotthilf Hempel, article, *Helgolander Wissenschaftliche Meeresuntersuchungen*, vol. 7, no. 2, 1960, pp. 72-79, illus., printed in German with English summary. Biologischen Anstalt Helgoland, Hamburg, Germany.

JAMAICA:

"The Economic and Social Effect of Public Credit in the Fishing Industry of Jamaica," by A. J. Thomas, article, *West Indies Fisheries Bulletin* no. 6, November-December 1960, pp. 1-8, processed. Ministry of Natural Resources and Agriculture, Federal House, Port-of-Spain, Trinidad, West Indies. Discusses the methods which were implemented to obtain public credit and ensure the success of a program of mechanization in the marine fisheries of Jamaica. Funds were provided for the purchase of outboard motors on long-term credit. Other plans to help the fishermen were: sale of duty-free gasoline/oil to fishermen; sale of necessary equipment at prices lower than those of commercial houses; and servicing of engines at nominal prices, as well as training the fishermen in improved fishing methods. Also included are the economic and social consequences of these plans.

JAPAN:

Bulletin of the Hokkaido Regional Fisheries Research Laboratory, No. 23, March 1961, 82 pp., illus., printed in Japanese with English abstracts. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Includes the following articles: "Studies on the Early Life History of Herring, *Clupea pal-*

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lasi. I--Habitat and Feeding Habits of the Larvae in Akkeshi Bay, Hokkaido," by Shoichi Mikami, and others; "The Seasonal Change of Gonad Weight of Sockeye and Chum Salmon in the North Pacific Ocean, Especially with Reference to Mature and Immature Fish," by Kenji Takagi; "Studies on Mechanisms of the Change in Quality of Primary Marine Products and Methods for the Prevention of Deterioration. I--The Comparative Aspects of the Change in Quality on Salted Saury and Saury Meal," by Katsutoshi Miwa and Echiko Konoshita; and "Studies on the Utilization of Marine Algae. I--Total Ash and Copper Contents in *L. religiosa* Miyabe and *L. angustata* Kjellm," by Shigeshi Komaki and Masako Matsumura. Also contains articles on: "Studies on Freezing of 'Surimi' (Fish Paste) and Its Application. IV--On the Effect of Sugar upon the Keeping Quality of Frozen Alaska Pollack Meat," by Kaoru Tamoto and others; "Studies on the Characteristic Qualities of Fish Meat. III--On Insolubility of Extracted Actomyosin Brought about by Freezing. IV--Denaturation of Muscle Owing to Deterioration of Freshness and Freezing. V--On Changes in the Water-Holding Capacity of Alaska Pollack during Freezing," by Toshio Tokunaga and Masayoshi Nakamura.

JAPAN SEA:

"Pervichnaya Produktiya Yaponskogo Morya i Chasti Tikhogo Okeana, Prilegayushchey k Yaponii, Vesnoy 1957 G." (The Primary Production of the Japan Sea and of the Part of the Pacific Ocean Near Japan in the Spring 1957), by Yu. I. Sorokin and O. I. Koblenz-Mishke, article, *Doklady Akademii Nauk SSSR*, vol. 122, no. 6, 1958, pp. 1-18, 1020, printed in Russian. *Doklady Akademii Nauk SSSR*, Podsozenski per. 21, Moscow B-64, U. S. S. R.

LAMPREY:

"Partitioning of Body Water in Sea Lamprey," by Thomas B. Thorson, article, *Science*, vol. 130, no. 3367, 1959, pp. 99-100, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave., NW., Washington 5, D. C.

LOBSTERS:

"The Norway Lobster," article, *World Fishing*, vol. 10, no. 6, June 1961, pp. 45-46, 53-54, illus., printed. World Fishing, John Trundell (Publishers) Ltd., St. Richard's House, Eversholt St., London NW1, England.

LOUISIANA:

"A Study of an Estuarine Area with Water-Level Control in the Louisiana Marsh," by Gordon Gunter, and William E. Shell, Jr., article, *Proceedings of the Louisiana Academy of Science*, vol. 21, 1958, pp. 5-34, printed. *Proceedings of the Louisiana Academy of Science*, Louisiana University, Baton Rouge, La.

MARINE ALGAE:

"Chemical Studies on Marine Algae. XIII--Isolation of Crystalline L-Citrulline from *Chondrus ocellatus* and *Rhodoglossum pulchrum*," by Mitsuo Kuriyama, Mitsuo Takagi, and Kichiro Murata, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 10, November 1959, pp. 277-283, printed. Bulletin of the Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

The Effect of Temperature on the Growth and Survival of Several Marine Algal Species, by Ravenna Ukeles,

10 pp., illus., printed. (Reprinted from *Biological Bulletin*, vol. 120, no. 2, April 1961, pp. 255-264.) Marine Biological Laboratory, Woods Hole, Mass.

"The Rim of the Reef," by E. Yale Dawson, article, *Natural History*, vol. 70, no. 6, June-July 1961, pp. 8-16, illus., printed. The American Museum of Natural History, Central Park W. at 79th St., New York 24, N. Y.

MARINE SHELLS:

How to Know the American Marine Shells, by R. Tucker Abbott, 234 pp., illus., printed, 75 cents. New American Library of World Literature, Inc., 501 Madison Ave., New York 22, N. Y. An authoritative guide to shells of the Atlantic and Pacific coasts.

MARLIN:

"Distribution of the Blue Marlin and Black Marlin in the Indo-Pacific," by James E. Morrow, Jr., article, *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 9, no. 3, 1959, pp. 321-323, printed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

MINK FEED:

Antioxidants and Other Feed Additives in Fish Diets for Minks: Effect on Reproduction and Steatitis, by J. R. Leekley and C. A. Cabell, Production Research Report No. 49, 23 pp., printed. Agricultural Research Service, U. S. Department of Agriculture, Washington 25, D. C., April 1961. Discusses the techniques and results of cooperative research conducted on the feeding of fish waste to minks. The availability of large amounts of fish cannery waste in the Alaska area as feed for minks and the susceptibility of this product to rancidity prompted tests on feed additives that might preserve this material. From previous experiments and practical mink feeding, it was known that stored frozen fish waste, fed at relatively high levels, resulted in steatitis (yellow fat disease) in minks. Also in these previous studies supplementary antibiotic or tocopherols at the levels used, though of some help, failed to prevent the disease. In the present tests, the phenolic antioxidants, including DPPD and BHT, were tested as additives to fish waste diets in factorially designed experiments. In these experiments, conducted during a 5-year period, a total of 474 female minks and their 1,420 kits were fed the experimental diets through the breeding, gestation, and suckling periods. Many of the animals were fed to pelting. Results showed that while DPPD causes adverse effects on mink reproduction, BHT has no ill effects on reproduction and is useful in preventing steatitis.

MINNESOTA:

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intervals, as research is completed. The Department of Mollusks, Academy of Natural Sciences of Philadelphia, Philadelphia, Pa. Indo-Pacific Mollusca is a series of taxonomic monographs of the marine mollusks found from the east coast of Africa to the East Indies, southern Japan, northern Australia and eastward through Polynesia. Each number covers all the known recent and tertiary species of a genus or family, and includes full synonymies, full descriptions, measurements, types, ranges, locality records, comparative remarks, and a condensation of anatomical, ecological, and economic information. All species are illustrated either in full color, black-and-white photographs, or line drawings.

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"Studies on the Properties of Shark Skin as a Material for Manufacturing Leather," by Toyoo Takahashi and others, article, *Bulletin of the Tokai Regional Fisheries Laboratory*, no. 15, January 1957, pp. 95-238, printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-Ku, Tokyo, Japan.

SHARKS:

Guide to the Study of the Anatomy of the Shark, NEOTRUS, and the Cat, by Samuel Eddy, Clarence F. Oliver, and John P. Turner, 141 pp., printed. John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

SHELL:

"MOP Shell Production up 34%," article, *Fisheries Newsletter*, vol. 20, no. 5, May 1961, pp. 9, 11,

printed. Fisheries Newsletter, Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia. Discusses the reasons behind the rise in over-all production, decrease in exports, and endeavors to encourage the use of mother-of-pearl shell. Included are statistical tables on the production and export of mother-of-pearl and trochus shells, and number of vessels and men employed, 1956-1960.

SHRIMP:

Estudio del Crecimiento Relativo de la Gamba Blanca (PARAPENAEUS LONGIROSTRIS Lucas) de Mallorca (Study of the Relative Growth of the White Shrimp--*Parapenaeus Longirostris* Lucas--of Majorca), by Miguel Massuti, *Boletín del Instituto Español de Oceanografía*, No. 102, July 1960, 23 pp., illus., printed in Spanish. Secretary, Instituto Español de Oceanografía, Alcala, 27, Madrid, Spain.

Growth and Migration of the Tortugas Pink Shrimp, PENAEUS DUORARUM, and Changes in the Catch Per Unit of Effort of the Fishery, by E. S. Iversen and A. C. Jones, Technical Series No. 34, 29 pp., illus., printed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., January 1961. Growth and migratory behavior of tagged pink shrimp were studied on the Dry Tortugas fishing grounds, December 1957-September 1959. The average rate of recovery of tagged shrimp was about 10 percent. There is apparently little difference between winter and summer growth rates. Using both sexes, small shrimp (67 count or 25 mm. carapace length) increased about 10-11 count per month; medium shrimp (33 count or 33 mm. carapace length) increased about 2-3 counts per month; and large shrimp (20 count or 40 mm. carapace length) increased about 0-1 count per month. On the fishing grounds, tagged shrimp moved a maximum of 5 miles per day and in all directions from the point of release. The majority moved to deeper water in a northwesterly direction. Despite increased fishing effort, the trend line of total production is approximately level. The catch per boat night has declined over the years 1950-1959.

SINGAPORE:

Report of the Fisheries Division 1959, 28 pp., printed. Fisheries Division, Ministry of Commerce and Industry, Singapore, 1961. Reviews the achievements of the Fisheries Division during 1959 and discusses development of brackish-water shrimp ponds, the fisheries loan fund, the fisheries mobile unit, the apprenticeship training program and the Pilot Fisheries Training School. Also covers an inventory of the industry--manpower, licensed fishing boats and gear, and pond cultivation of fish; fresh fish supplies--gross landings, local production, and imports and exports of fresh fish; fresh fish prices; trade in dried salt fish and other marine products; and cost of fishing material. A large portion of the report is devoted to statistical tables showing number of fishermen, licensed vessels and gear, fresh fish supplies, foreign trade in fishery products, and other pertinent data.

SMALL BUSINESS MANAGEMENT:

Building Growth-Mindedness into Your Business, by Harold B. Maynard, *Management Aids for Small Manufacturers* No. 125, 4 pp., processed. Small Business Administration, Washington 25, D. C., June 1961.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Growth is essential to the long-term success of any small firm. "The starting point for sustained growth is in building growth-mindedness into your associates and employees," states the author. The owner-manager can accomplish this by stressing such benefits as greater profits, greater stability, stronger competitive position, and greater opportunities for advancement. Activities by a firm which almost inevitably lead to growth include reducing costs, improved product quality, engaging in creative marketing, planning to use new developments, and seeking expansion through merger and acquisition.

SMELT:

"*Osmerus mordax*--the Smelt," by Robert M. Roecker, article, *The Conservationist*, April-May 1961, pp. 16-18, illus., printed, *The Conservationist*, Rm. 335, State Campus, Albany, N. Y. Discusses the stocking of the Great Lakes and New York's Finger Lakes with smelt and the development of the fishery in these areas; and their spawning and feeding habits. Also discusses dip-net regulations in New York State; smelt as bait fish; landings and value of the catch; vessels used; and experimental trawling in the Lake Erie smelt fishery.

SMOKING:

"Studies on the Utilization of Electro-Smokes-Solution for Fish Smoking," by Yasuhiko Tsuchiya and Tomoo Nakano, article, *Tohoku Journal of Agricultural Research*, vol. 11, April 1960, pp. 63-81, printed, Faculty of Agriculture, Tohoku University, Sendai, Japan.

SPINY LOBSTERS:

"Les Douarnenistes Vont Pecher la Langouste Brune sur les Cotes du Bresil" (Fishermen from Douarnenez Want to Fish for Brown Spiny Lobsters Off the Coast of Brazil), article, *La Pêche Maritime*, vol. 40, no. 998, May 20, 1961, pp. 283-286, illus., printed in French, La Pêche Maritime, 190 Boulevard Haussman, Paris, France.

SPORT FISHING:

"The Use of Probability Sampling for Estimating Annual Number of Angler Days," by Norman Abramson and Joyce Tolladay, article, *California Fish and Game*, vol. 45, no. 4, 1959, pp. 303-311, printed, California Dept. of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif.

SQUID:

"Studies on the Organic Phosphates in Muscle of Aquatic Animals. VIII--Preparation of Inosinic Acid from Squid Muscle," by Tsuneyuki Saito and others, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, March 1960, pp. 317-320, printed in Japanese with English abstract, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

STURGEON:

"O Novom Sposobe Mecheniia Osetrovkyh" (On the New Method of Marking Sturgeon), by V. N. Zlokazov, article, *Rybnoe Khoziaistvo*, no. 3, March 1959, pp. 1-16, printed in Russian, *Rybnoe Khoziaistvo*, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

TAGGING:

"California Sturgeon Tagging Studies," by Harold K. Chadwick, article, *California Fish and Game*, vol. 45,

no. 4, 1959, pp. 297-301, printed, California Dept. of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif.

TEXAS:

Marine Resources of the Corpus Christi Area, by Arvid A. Anderson, Research Monograph No. 21, 54 pp., illus., printed, \$1.50. Corpus Christi Chamber of Commerce, Corpus Christi, Tex., June 1960.

TILAPIA:

Age, Growth and Breeding Season of TILAPIA ZILLII Gervais in Egyptian Experimental Ponds, by A. R. El Bolock and R. Koura, Notes and Memoirs No. 49, 41 pp., illus., printed in English and Arabic, Ministry of Agriculture, Hydrobiological Department, Institute of Freshwater Biology, Gizira--Cairo, Egypt, 1960.

Age, Growth and Survival of TILAPIA MOSSAMBICA (Peters) in Egyptian Ponds, by R. Koura and A. R. El Bolock, Notes and Memoirs No. 41, 21 pp., illus., printed in English and Arabic, Ministry of Agriculture, Hydrobiological Department, Institute of Freshwater Biology, Gizira--Cairo, Egypt, 1958.

Notes on the Breeding Behavior, Embryonic and Larval Development, of TILAPIA ZILLII Gervais, by A. E. Imam and M. T. Hashem, Notes and Memoirs No. 51, 21 pp., illus., printed in English and Arabic, Ministry of Agriculture, Hydrobiological Department, Serow Fish-Farm, Gammalia, Dakahlia, Egypt, September 1959.

"Some Marking Experiments with the Tilapia Fish," by C. F. Hickling, article, *Malayan Agricultural Journal*, vol. 42, no. 1, 1959, pp. 21-30, printed, Department of Agriculture, Kuala Lumpur, Federation of Malaya.

TOXICITY:

"Toxicologic Studies on Paralytic Shellfish Poison," by G. S. Widberg and N. R. Stephenson, article, *Toxicology and Applied Pharmacology*, vol. 2, 1960, pp. 607-615, printed, Toxicology and Applied Pharmacology, Academic Press, Inc., 111 Fifth Ave., New York 3, N. Y.

TRADE LISTS:

The Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade lists. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1 a copy.

Canneries--India, 16 pp. (April 1961). Lists the names and addresses of canneries, size of firms, and types of products handled by each firm. Includes fish canneries.

Canneries and Frozen Foods--Producers and Exporters--Japan, 26 pp. (May 1961). Lists the names and addresses, size of firms, and types of products handled by each firm. Includes fish and shellfish canneries, freezers, and exporters.

Canneries and Frozen Foods--Producers and Exporters--El Salvador, 5 pp. (May 1961). Lists the names and addresses, size of firms, and types of products

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handled by each firm. Several fishing companies operate modern shrimp boats along the Salvadoran Pacific Coast. Some of them maintain plants where shrimp are processed and frozen, then exported by air--principally to the United States.

TRAWLING:

"Recherches Concernant le Chalutage Pelagique a un Seul Bateau" (Researches into Midwater Trawling with One Boat), by J. Ancellin and C. Nedelec, article, *Science et Peche*, no. 81, May 1960, 5 pp., illus., printed in French. Science et Peche, L'Institut Scientifique et Technique des Peches Maritimes, 59 Avenue Raymond-Poincare, Paris 16^e, France.

TRAWLS:

"Les Modeles Reduits de Chaluts" (Scale Models of Trawls), by C. Nedelec, article, *Science et Peche*, no. 79, March 1960, 6 pp., printed in French. Science et Peche, L'Institut Scientifique et Technique des Peches Maritimes, 59 Avenue Raymond-Poincare, Paris 16^e, France.

TROUT:

Fishing Fun with Your Own Trout Pond, 16 pp., illus., printed, 50 cents. U. S. Trout Farmers Assn., 110 Social Hall Ave., Salt Lake City, Utah. Discusses the basic requirements for growing trout, the selection and construction of a fish pond, restocking, and kinds of trout desired. Also includes landscaping of a trout pond, weed control, and a list of reference literature. Detailed illustrations provide a complete outline of location and construction of trout ponds.

"Osmo-Regulatory Adaptation of Steelhead Trout (*Salmo gairdneri* Richardson) to Sea Water," by Arthur Hillier Houston, article, *Canadian Journal of Zoology*, vol. 37, no. 5, 1959, pp. 729-748, printed, Canadian Journal of Zoology, Division of Administration, National Research Council, Sussex St., Ottawa 2, Canada.

"Some Effects of Oxygen in Relation to Temperature on the Development of Lake Trout Embryos," by E. T. Garside, article, *Canadian Journal of Zoology*, vol. 37, no. 5, 1959, pp. 689-698, printed, Canadian Journal of Zoology, Division of Administration, National Research Council, Sussex St., Ottawa 2, Canada.

TUNA:

"Stomach Contents and Organ Weights of Some Bluefin Tuna (*Thunnus thynnus* Linnaeus), Near Bimini, Bahamas," by Louis A. Krumholz, article, *Zoologica Scientific Contributions of the New York Zoological Society*, vol. 44, part 3, nos. 6-8, 1959, pp. 127-131, printed, New York Zoological Society, Zoological Park, Bronx Park, New York 60, N. Y.

"Studies of an Unknown Factor in the Pyloric Caeca of Skipjack. I--Discovery of an Unknown Factor as a Substitute for the *Citrovorum* Factor," by Daiichi Kakimoto, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, August 1960, pp. 759-764, printed, Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-ku, Tokyo, Japan.

UNION OF SOUTH AFRICA:

29th Annual Report (April 1, 1957-March 31, 1958), 160 pp., printed. Department of Commerce and Industries, Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1960.

UNITED KINGDOM:

Report of Committee on Salmon and Freshwater Fisheries, Cmd. 1350, 159 pp., illus., printed, 8s. (about US\$1.15). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, May 1961. The report to Parliament of the Salmon and Freshwater Fisheries Committee appointed by the Minister of Agriculture, Fisheries and Food in October 1959 to review the Salmon and Freshwater Fisheries Acts, 1923-35, and their operations, taking into account the River Boards Act, 1958; and to make recommendations. Conclusions and recommendations of the Committee are presented under the following subjects: conservation of fisheries; obstructions to the passage of migratory fish; removal and diversion of water; pollution of rivers and lakes; constitution and functions of River Boards; and authority of the Minister of Agriculture, Fisheries and Food. Other topics covered include fishery finance and licenses; authority of enforcement officers; sale of fish; penalties and legal procedures for violation of fishery laws; and local provisions covering Scottish border rivers, Thames and Lee Rivers, and estuaries falling within the jurisdiction of two or more River Boards.

Scottish Sea Fisheries Statistical Tables, 1960, 48 pp., printed, 5s. (about 70 U. S. cents). Department of Agriculture and Fisheries for Scotland, St. Andrew's House, Edinburgh 1, Scotland, June 2, 1961. (Available from Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2, Scotland). Contains 27 statistical tables showing quantity and value of fish landed and cured, number of vessels and fishermen, and creek returns. Tables 1 through 19 cover quantity and value of fish landed by British and foreign vessels; landings of British vessels according to method of fishing, 1938-60; quantity, value, and average value of each kind of fish landed by British vessels in 1913, 1938, and 1953-60; and quantity and value of each kind of fish landed in specific districts by British vessels of various types. They also cover quantity of each kind of fish landed and expenditure of fishing effort in each fishing region by British vessels; quantity of each kind of fish landed by foreign vessels from each fishing region and quantity and value of fish landed by each nationality; and seasonal landings of herring. Tables 20 through 22 show quantity of herring cured, 1913-60, and quantity and value of white fish and herring cured in each district, according to method of cure. Tables 23 through 26 show fishing vessels by type and district; fishermen employed; and greatest number of vessels and persons employed in each district in any week. Table 27 shows number of vessels and fishermen and quantity and value of fish landed in creeks.

UNITED NATIONS:

Annual Report of the Technical Assistance Board to the Technical Assistance Committee, Supplement No. 5 to the Official Records of the 32nd session of the United Nations Economic and Social Council, 354 pp., illus., processed, limited edition. Information Center, United Nations, New York, N. Y., May 1, 1961. Among other topics, covers training of government officers in the protection and improvement of inland fishery resources, shellfisheries in Sudan, and changes in small-craft fishing in India and Ceylon.

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U.S.S.R.

"Ob Obogashchenii Kormovoy Bazy Ryb Vodokhranilishch Kryma" (On Enriching the Food Supply for Fishes in Crimean Reservoirs), by P. A. Zhuravel', article, Dopovidi Akademii Nauk Ukrain, vol. 4, 1958, pp. 456-458, printed in Russian. Dopovidi Akademii Nauk Ukrain, Kiev, Ukraine, U. S. S. R.

VESSELS:

"The Maintenance of Wooden Vessels," by A. Swinfield, article, South Pacific Bulletin, vol. 10, no. 3, July 1960, pp. 33-35, illus., printed. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia.

Outline and Index of a Study of Casualties Among U. S. Commercial Fishing Vessels: Causes, Effect, Corrective Measures, by D. T. Adams, 132 pp., illus., processed. U. S. Coast Guard, Washington 25, D. C., 1956.

WATER RESOURCE DEVELOPMENT:

The Conflict of Fish and Power: A Problem in the Water Resource Development of the Pacific Northwest, by W. R. D. Sewell, 81 pp., illus., processed, limited distribution. (A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts). Library, University of Washington, Seattle, Wash., 1956.

WHALE OIL:

"Production of Fatty Alcohols from Sperm Whale Oil," by P. S. Ugryumov, article, Zhurnal Prikladnoi Khimii, vol. 32, 1959, pp. 2324-2329, printed in Russian. Zhurnal Prikladnoi Khimii, Izdatel'stvo Akademii Nauk SSSR, Moscow, U. S. S. R.

"Vacuum Pyrolysis of Whale-Liver Oil," by Yoshimori Omote and Hiroshi Sumiyama, article, Shinku Kagaku, vol. 7, 1959, pp. 106-112, printed in Japanese. Shinku Kagaku, Japan Society of Vacuum Chemistry, Jissen Women's College, 101 Tokiwamatsucho, Sibuyaku, Tokyo, Japan.

WHALES:

"A Question in Whale Behavior," by Carleton Ray, article, Natural History, vol. 70, no. 6, June-July 1961, pp. 46-53, illus., printed. The American Museum of Natural History, Central Park W. at 79th St., New York 24, N. Y. Discusses the characteristics of whales, dolphins, and porpoises, and the reason for their voluntary stranding. Most solitary strandings

seem to be in response to sickness. Some of these mammals have been captured and observed under aquarium conditions.

"Utilizing the Whale," by Kjell Roed, article, Konkyljen, vol. 5, December 1960, pp. 27-29, printed in Norwegian. Konkyljen, Stord Marin Industri A.S., Bergen, Norway.

WORLD TRADE:

The following World Trade Information Service Reports, published by the Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C., are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 10 cents a copy.

Basic Data on the Economy of the United Kingdom, Economic Report No. 59-26, Part 1, 17 pp., illus., printed, March 1959.

Import Tariff System of Norway, Operations Report No. 61-24, Part 2, 2 pp., printed, March 1961.

Import Tariff System of the United Kingdom, Operations Report No. 60-43, Part 2, 2 pp., printed, September 1960.

Marking and Labeling Requirements of Federal Republic of Germany and West Berlin, Operations Report No. 61-11, Part 2, 4 pp., printed, March 1961.

WYOMING:

Annual Report--A Report of Activities of the Wyoming Game and Fish Commission, 1959, 103 pp., illus., printed. Wyoming Game and Fish Commission, Cheyenne, Wyo., January 1, 1960. Includes among others, a section on the operations of the Commission's Fish Division. Discusses the collection of fish eggs, principally trout, from wild stock; propagation of fish at hatcheries and rearing stations; distribution of fish by trucks and airplanes; regulations for protecting and expanding wild fish stocks; fisheries management, including assistance in propagation, surveys and investigations, and action programs in the various river systems. Action programs consisted of lake rehabilitation, development of fishing areas, access to fishing waters, maintenance of fishing areas screening irrigation ditches, and pollution control. Other activities were public relations programs, field biological investigations, and laboratory studies.



VITAMIN A CONCENTRATE FROM FISH-LIVER OIL

Acid clay weakened with a definite amount of a water solution of ammonia, urea, or NaOH was used as a material to adsorb impurities from the sample by normal column chromatography, shaking, and stirring. Under certain conditions, it was possible to concentrate Vitamin A by the use of weakened acid clay, but constant activity could not be secured with these adsorbents. (Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 3, 1960, pp. 196-203.)

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NATIONAL FISH 'n SEAFOOD PARADE--OCTOBER 16-22, 1961

The Fishing Industry and the U. S. Bureau of Commercial Fisheries are working together to encourage the greater use of fish and shellfish products during the "Fish 'n Seafood Parade"--October 16-22, 1961. This is the Fishing Industry's seventh annual all-out promotion channeled over radio, television, newspapers, and magazines. Many retail stores and restaurants are making a concerted effort to display and stock the many varieties of fishery products available.

In June 1961 preparations for the Seafood Parade began gathering momentum when the Fish 'n Seafood Parade National Committee made a broadside mailing of brochures to chain

stores, distributors, and other segments of the industry. Also, the Committee offered in-store advertising kits in color consisting of a pole display and diecut poster set.

The industry has planned an extensive advertising



publicity, and merchandising program during the period. As its contribution, the Bureau of Commercial Fisheries nationally distributed consumer education materials to newspaper editors and other food publicists, public and private schools participating in the National School Lunch Program, restaurants, public and private institutions, in-plant feeders, and the retail food trade. Black and white food photographs were supplied to newspaper food columnists. In addition, the Bureau contacted television and radio stations throughout the country to stimulate the use of animated public service television spots and public service recorded announcements and radio scripts previously distributed by the Bureau. These were augmented by personal appearances of Bureau home economists and marketing specialists on radio and television food shows throughout the country.

Chowders of many kinds of fish and shellfish highlight this year's Fish 'n Seafood Parade. Fish chowder is one of President and Mrs. Kennedy's favorite foods.

A jolly sailor boy on a huge fish again is the Fishing Industry's emblem, used in both publicity and advertising, local and national.

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